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Recommendations for fish & wildlife program under the Pacific Northwest Electric Power Planning and Conservation Act

RECOMMENDATIONS FOR FISH AND WILDLIFE PROGRAM

UNDER THE

PACIFIC NORTHWEST ELECTRIC POWER

PLANNING AND CONSERVATION ACT

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CONFEDERATED TRIBES AND BANDS - YAKIMA INDIAN NATION

TABLISHED BY THE
EATY OF JUNE 9, 1855
NTENNIAL JUNE 9, 1955

CONFEDERATED TRIBES AND BANDS
Yakima Indian Nation

POST OFFICE BOX 151
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GENERAL COUNCIL
TRIBAL COUNCIL

November 12, 1981

The Honorable Dan Evans, Chairman
Pacific Northwest Electric Power and
Conservation Planning Council
c/o Washington State Energy Office
400 E. Union, ER-11
Olympia, WA 98504

Dear Dan:

The Yakima Indian Nation as an addition to the Joint Recommendations of Fisheries Agencies and Indian Tribes in accordance with Section 4h of P.L. 96-501 submits the following statement as a recommendation:

The Yakima Indian Nation believes that the following facts, some of which are to date fully understood and appreciated only by Indian People, should become a part of the recommendations for Section 4h of P.L. 96-501. These facts are believed supportive of fish protection for non-Indian, as well as Indian fishermen.

1. The Religion of the Yakima Indian People is inextricably bound up in our Food Rights and our Mineral Rights. The salmon and the waters of the rivers and streams are both vital parts of our constitutionally protected right to practice our religion.

2. United States Legal Precedent includes reference to Nuisance Law which declares that a neighbor does not have the right to pollute or violate the area beyond his own borders with noxious and poisonous elements which do violence to the use and enjoyment by neighbors of their own lands. This is particularly true where the polluter is the more recent land holder in the area.

3. Environmental Impact Studies (which include Environmental Impact Statements, Safety Evaluation Reports, Socio-economic Impact Studies, and others) to date from both public and private organizations within the Columbia River Basin area have consistently failed to look beyond the Judeo-Christian socio-economic heritage when investigating potential nuisances to neighbors from a given undertaking. The result has been repeated Nuisance Trespass on the Sovereign Rights of the Yakima Indian Nation guaranteed by the Treaty of 1855. This oversight has flawed environmental studies in 2 principle ways:

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- Beyond the Boundaries of the Yakima Reservation, on the Ceded Lands where the Yakimas have Reserved Rights, those Rights have been ignored and violated time and again.

- Within the Boundaries of the Yakima Reservation, Nuisance Trespass occurs because the public or private organizations have not been considerate of the Culture and Sovereignty of the Yakima People.

The result of the above facts has been a history of violations of the Rights guaranteed to the Yakima People by their Treaty of 1855, by the Constitution of the United States, and by the Law of the Land.

The Yakima Indian Nation sees much that needs to be accomplished before Section 4h of P.L. 96-501 is finalized and becomes binding on the parties involved:

1. Environmental studies by public and private organizations must fully consider and respect the Sovereignty and socio-economic heritage of their Indian neighbors.

2. Indian Peoples must be invited to play a seminal rolè in all of these studies to reflect their own value systems.

3. Indian Peoples must have expert assistance so that they may properly protect their interests in these environmental studies. This expert assistance must be funded from the power revenues.

4. Scientific Monitoring, involving biology, chemistry, and physics must become a routine, ongoing process designed to protect Indian Rights to fish, and the Rights to a catch which is free of pollution, and safe for the health of our People. (See Section 1.7 of the Coordinated Recommendations of Fisheries Agencies and Indian Tribes).

5. Emergency Response Plans required by the Nuclear Regulatory Commission must be conceived, developed, and implemented by stand-by services and equipment to meet the particular needs of Indian Nations and again funded from the power revenues. (Supra. Sect. 1.7).

The Yakima fishermen do not pretend to speak for all fishermen, but they believe that the Yakimas have a duty to protect Nature for those yet unborn. This duty, rooted in our Indian Heritage, we trust will result in the protection of the rights of all fishermen, Indian and non-Indian alike.

The Yakima Indian Nation requests the time and expert assistance necessary, in the light of the above facts, considerations, and recommendations, in cooperation with others, both Indian and non-Indian, to:

- Incorporate into Section 4h of P.L. 96-501 the material discussed above.

- Analyze the present contents of Section 4h of P.L. 96-501 to assure that the existing text is comprehensive enough to cover Indian concerns and values.

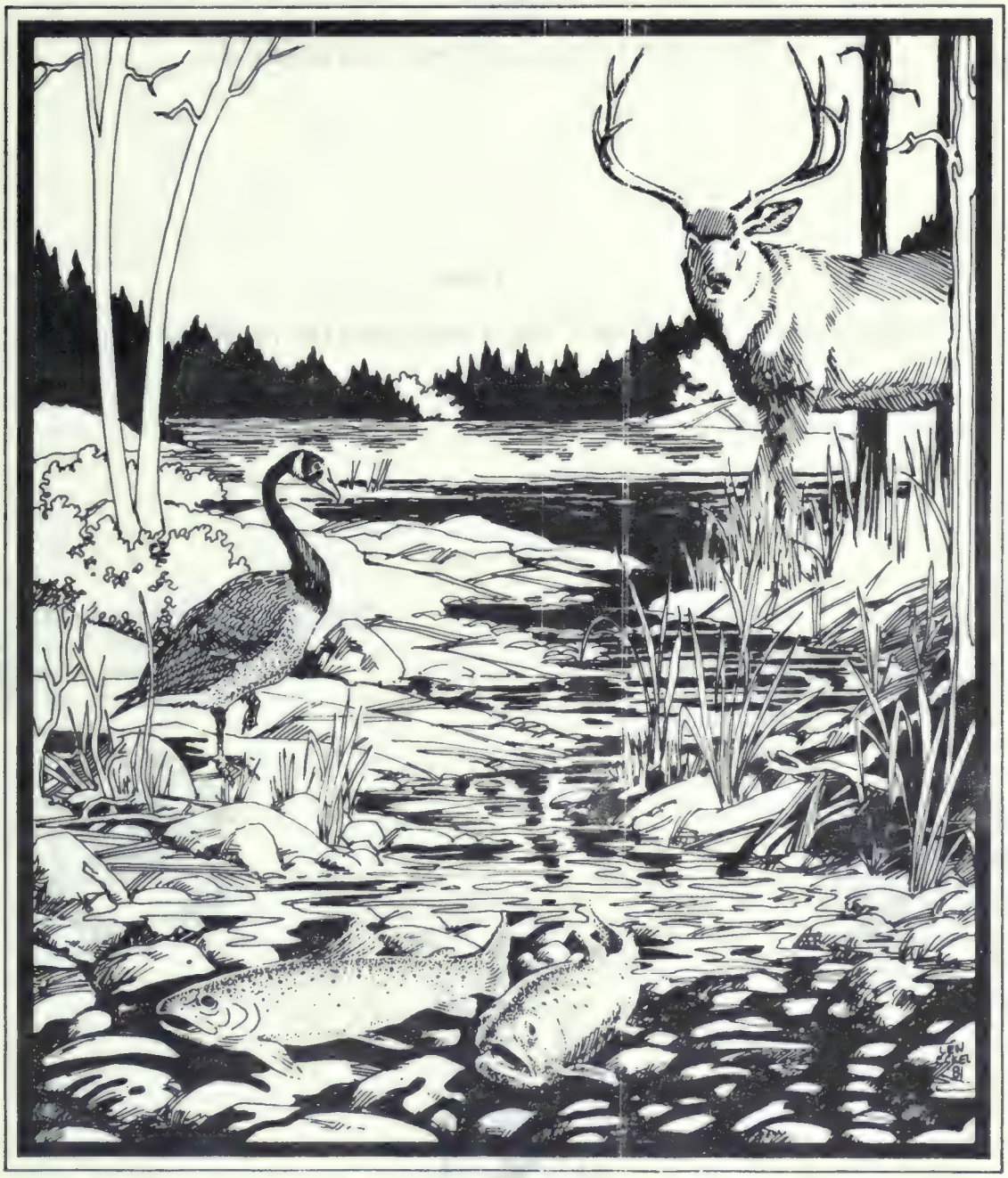
Sincerely yours,

Johnson Meninick, Chairman
Yakima Tribal Council
Yakima Indian Nation

STATE OF MONTANA

MONTANA

Recommendations For Fish & Wildlife Program



Submitted To

Pacific Northwest Electric Power And Conservation Planning Council

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MONTANA

Recommendation for Fish and Wildlife Program

Submitted to:

PACIFIC NORTHWEST ELECTRIC POWER AND CONSERVATION PLANNING COUNCIL

Submitted by:

James W. Flynn, Director
Montana Department of Fish
Wildlife and Parks

Tom Pablo, Chairman
Confederated Salish and
Kootenai Tribes

Wally Steucke
Area Manager
U.S. Fish and Wildlife
Service

November, 1981

MONTANA

RECOMMENDATIONS FOR A FISH PROGRAM

Prepared by:

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STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME

POSITION STATEMENT OF THE
MONTANA DEPARTMENT OF FISH, WILDLIFE, AND PARKS

Headwater streams from three great river systems drain Montana, including the Columbia, Missouri, and Saskatchewan rivers. The over 26,000 square miles of Western Montana which drain into the Columbia, contain 5,290 miles of trout streams and rivers and over 820 lakes and reservoirs.

Many of the major sport fish in Western Montana streams and lakes are migratory. Migrations of westslope cutthroat trout and trophy-sized bull trout cover over 100 miles in the Flathead River system to reach their spawning grounds. These migratory populations provide important recreation for Montanans and their visitors.

Western Montana supports a diversity of wildlife including grizzly bears, mountain goats, moose, harlequin ducks, river otter and numerous other game and nongame species. Many forms of wildlife also use a variety of habitat seasonally to sustain their population size. Riparian vegetation and valley meadows are important to most forms of wildlife.

Construction of hydroelectric projects on these river systems, while providing energy and flood control, has generally resulted in a negative impact on fish and wildlife by blocking migrations and changing or eliminating habitat. For the most part these impacts have gone unmitigated. A balance must be reached to insure an adequate, reliable, and cost-effective power supply while insuring these impacts on fish and wildlife are adequately mitigated.

The advent of the Regional Power Act has brought a long needed mechanism to provide stable energy planning for the Pacific Northwest. One important aspect of this legislation is the development of a fish and wildlife program in recognition of the impact hydroelectric development has had on fish and wildlife throughout the Columbia River basin and beyond. This should include addressing the cummulative impact of energy development on fish and wildlife and the insurance of adequate protection for those resources which cannot be mitigated or replaced.

The cooperative process which produced this document must be continued to insure that an effective and agreeable program is developed. Montana's unique natural resources now more than ever must be recognized for they do truly represent the last of what is best.

James W. Flynn
Director
Montana Department of Fish, Wildlife, and Parks

THE CONFEDERATED SALISH AND KOOTENAI TRIBES
OF THE FLATHEAD RESERVATION

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Pablo, Montana 59855
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FLATHEAD NATION

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Laurence Kenmille - Vice-Chairman
Victor L. Stinger - Tribal Secretary
Joseph F. McDonald - Tribal Treasurer
Louis Adams
John McClure
E.W. Morigeau
Sonny Morigeau
Noel Pichette
Thomas Swaney

POSITION STATEMENT OF THE CONFEDERATED SALISH AND KOOTENAI TRIBES

The Confederated Salish and Kootenai Tribal Council provides the direction needed to manage all tribal resources within the exterior boundaries of the Flathead Indian Reservation. Because of the importance of proper tribal resource management and an ever increasing demand on the resource of the lower Flathead River and Flathead Lake, it is essential to recognize the needs and concerns of the tribal people and the residents of Montana. Tribal resources will be managed for both energy production and fish, wildlife and recreation.

The lower Flathead River and the south half of Flathead Lake have been historically and still are a nucleus for the Indian people's cultural, physical and economic needs. The Tribes believe that recreational, cultural and historical resources are of equal importance to fish and wildlife resources. They also believe the Pacific Northwest Power and Planning Conservation Act itself implies their importance. Subsistence hunting and fishing are culturally and economically important to the Salish and Kootenai people.

To fulfill the Tribes' obligations to protect and enhance the wildlife and fisheries that may be affected by the Pacific Northwest Power Act, a thorough resource inventory and investigation of fish, wildlife and recreation use are needed. Currently, the Tribes lack information on the effects of the operation of Kerr Dam which are needed to establish guidelines to effectively maximize fisheries/wildlife protection and at the same time optimize power production. It is the intention of the Tribes to pursue the funding for studies necessary to fill these important needs.

Thomas E. Pablo, Chairman
Tribal Council

ACKNOWLEDGEMENTS

Council members Keith Colbo and Gerald Mueller provided the catalyst for the development of the Montana Fish, Wildlife and Power Ad Hoc Committee and support funding for staff to coordinate the development of these recommendations. However, they have not been directly involved in developing the recommendations.

A number of people have assisted in preparing this document. Department of Fish, Wildlife and Parks biologists that assisted in providing information and review included Art Whitney, Jim Posewitz, Gene Allen, Dennis Workman, Bob Schumacher, John Firebaugh, Dick Weckworth and their staffs. Review and editing was also provided by James Claar, wildlife specialist, and David Rockwell, recreation planner for the Bureau of Indian Affairs, and Larry Lockard, U.S. Fish and Wildlife Service. Leo Berry, Director of the Department of Natural Resources and Conservation and his staff reviewed the draft and final recommendations.

Steve Leathe provided much needed assistance compiling comments, review and editing in the final stages of preparation. Mike Aderhold and Steve Leathe assisted in conducting the four public meetings. Committee members provided constructive criticism and information at all stages in development of these recommendations. Their open and positive approach is to be commended.

The Confederated Salish and Kootenai Tribes wish to acknowledge the cooperation and assistance which they received from other agencies and individuals in the development of this paper. In particular, we would like to thank the Wildlife Branch of the Bureau of Indian Affairs, Patrick Graham of the Montana Department of Fish, Wildlife and Parks, U.S. Fish and Wildlife Service, Bonneville Power Administration, and Montana Power Company.

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INTRODUCTION

REGIONAL POWER PLANNING ACT

Passage of the Pacific Northwest Electric Power Planning and Conservation Act (PL96-501) by Congress in 1980 marked the beginning of a new era for regional energy planning. The Act called for the establishment of a Regional Power Planning Council with two representatives, each from Washington, Oregon, Idaho and Montana. This Council has two years to develop a regional energy plan. Background information on the legislation and Council is provided in Appendix A.

One significant aspect of the Act was the emphasis it placed on protection, mitigation and enhancement of fish and wildlife that have been affected by hydroelectric development on the Columbia River and its tributaries. The Act requires the Council to develop a fish and wildlife program to address these impacts prior to completion of the energy plan.

On 10 June 1981, the Council issued a call to State and Federal fish and wildlife agencies and Indian tribes for recommendations of measures to be considered in development of the Fish and Wildlife Program. These groups had until 15 November 1981 to submit their recommendations. Although the Act emphasizes anadromous fish (ie. sea-run salmon and trout), it specifically addresses resident fish and wildlife.

The geographic area specified for the Fish and Wildlife Program includes the Columbia River and its tributaries. This would include that portion of Montana west of the Continental Divide, approximately 26,000 square miles.

The specific language from the Act dealing with the fish and wildlife program is presented in Appendix B. Recommendations would include:

1. Measures that "can be expected to be implemented" by the Bonneville Power Administration to protect, mitigate and enhance fish and wildlife affected by Columbia Basin hydroelectric project construction and operation;

2. Establish objectives for development and operation of projects to protect, mitigate and enhance fish and wildlife;

3. Fish and wildlife management coordination and research to assist in protection, mitigation and enhancement at and between the region's hydroelectric dams.

The Council must develop and adopt the fish and wildlife program within one year after the time provided for receipt of the recommendations. The Council must insure that measures in the program meet the following criteria:

(a) complement the existing and future activities of the region's State and Federal fish and wildlife agencies and appropriate Indian tribes;

(b) be based on, and supported by, the best available scientific knowledge;

(c) utilized, where equally effective alternative means of achieving the same sound biological objective exist, the alternative with the minimum economic cost;

(d) be consistent with the legal rights of appropriate Indian tribes in the region; and

(e) in the case of anadromous fish -

(i) provide for improved survival of such fish at hydroelectric facilities located on the Columbia River system; and

(ii) provide flows of sufficient quality and quantity between such facilities to improve production, migration, and survival of such fish as necessary to meet sound biological objectives.

This fish and wildlife program will be developed along with the other purposes of the Act such as assuring the region an adequate, efficient, economical, and reliable power supply. Section 4(h)(11)(A) requires Bonneville Power Administration and other Federal agencies responsible for managing, operating, or regulating Federal or non-Federal hydroelectric facilities located on the Columbia River or its tributaries "in a manner that provides equitable treatment of such fish and wildlife" ..."taking into account at each relevant stage of decision making process to the fullest extent practicable, the program adopted by the Council."

DEVELOPMENT OF RECOMMENDATIONS

The Organization

On 25 June 1981, a meeting with Council members Keith Colbo and Gerald Mueller resulted in the formation of the Montana Fish, Wildlife and Power Ad Hoc Committee. Fish and Wildlife agencies, the Confederated Salish and Kootenai Tribes, and the operators of Western Montana's hydro projects agreed to work together in preparing recommendations for the fish and wildlife program.

Montana Department of Fish, Wildlife and Parks, the Confederated Salish and Kootenai Tribes and U.S. Fish and Wildlife Service worked together to prepare the recommendations. They agreed to submit a coordinated package with appropriate position statements and recommendations. They also agreed to work with the operating agencies and evaluate their comments and concerns throughout the review process.

Montana Power Company, Washington Water Power Company, Pacific Power & Light, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, representatives of the proposed Kootenai River Project, Bureau of Indian Affairs, and U.S. Forest Service participated in an active role by providing data and critical review of the draft recommendations, problem statements and project recommendations.

Process

A series of meetings of the Montana Fish, Wildlife and Power Ad Hoc Committee were held from June through September, 1981. Their purpose was to coordinate the development of goals, objectives and recommendations of measures to protect, mitigate and enhance fish and wildlife impacted by hydroelectric development in that portion of Montana draining into the Columbia River Basin.

Staff were provided by the Montana Department of Fish, Wildlife and Parks through funding by Montana's Council members Keith Colbo and Gerald Mueller. The staff collected information from sources within and outside the committee. They prepared a detailed list of goals and objectives and also drafts of problem statements, recommendations and justification were critically reviewed by the committee. This document is the result of that review process.

The Committee agreed that public involvement was an important element in this process. Four sites were selected in Western Montana to hold public meetings. These sites were Missoula, Noxon, Libby and Kalispell. The meetings were held October 5 through 8. Written comment was accepted at the meetings and for one week following. The committee chairman conducted the meetings explaining implication of the Act, the role of the Council and recommendations made for protection and mitigation of fish and wildlife. Written comments received following these meetings were positive and for the most part general in nature.

During this time period, committee members and other interested parties reviewed the document and made their written comments by October 16. A final document was sent to the committee members on October 23 for their review. Final position statements supporting the process and identifying areas of disagreement were required by October 30. These statements are contained in Appendix D of this document.

It was anticipated that not all issues would be resolved in this process. However, areas where agreement could be reached would facilitate development of a workable and effective fish and wildlife program. By approaching this opportunity in a cooperative nature, Montana has demonstrated its ability and desire to protect and mitigate its fish and wildlife resources while meeting the other purposes of the Act.

Development of recommendations was also coordinated with the Fish and Wildlife Ad Hoc Committee working primarily through the Resident Fish Committee. The numbers following the fishery recommendations in this document correspond to objectives developed by the Resident Fish Committee members Bill Nelson, Tony Elred, Jim Griggs, Herb Pollard and Pat Graham.

FLATHEAD RIVER BASIN

BASIN DESCRIPTION

Geography

The Flathead River Basin is the northeasternmost river basin in the Columbia River drainage. Three forks of the Flathead River, approximately equal in size, drain the west slope of the Continental Divide in northwest Montana and southeast British Columbia (Figure 1).

The North Fork Flathead River originates in the Canadian Rocky Mountains and flows south into Montana, forming the western boundary of Glacier National Park. All of the Montana portion of the North Fork is included in the National Wild and Scenic Rivers Program. For 40.7 miles from the Canadian border to Camas Creek, the North Fork is classified as a scenic river. The lower 17.6 miles from Camas Creek to the confluence with the Middle Fork is classified recreational.

The Middle Fork Flathead River originates in the Bob Marshall Wilderness Area. It flows in a generally northwest direction, forming the southwest boundary of Glacier National Park, until it joins the North Fork to form the main stem Flathead River. The entire length of the Middle Fork is included in the Wild and Scenic River Program. The upper 46.6 miles is classified wild. The lower 44.4 miles is classified recreational.

The South Fork Flathead River also originates in the Bob Marshall Wilderness. Its course generally parallels that of the Middle Fork. The South Fork empties into the Flathead River 9.6 miles downstream of the confluence of the North and Middle Forks. The lower five miles of the South Fork is regulated by Hungry Horse Dam, which impounds 35 miles of the South Fork. The South Fork from the headwaters of Hungry Horse Reservoir upstream to Spotted Bear (8.8 miles) is classified recreational. Above Spotted Bear, the South Fork is classified a wild river.

The upper Flathead River flows 55 miles from the confluence of the North and Middle Forks to Flathead Lake. The Flathead upstream of the mouth of the South Fork (9.6 miles) is classified recreational. The lower 45.4 miles is partially regulated by Hungry Horse and Kerr Dams (Kerr Dam backs water approximately 20 miles up the Flathead River).

Flathead Lake is the largest natural body of fresh water west of the Mississippi River, covering 126,000 acres. The lake is 28 miles long and five to 15 miles wide. Its only major tributary other than the Flathead River is the Swan River, which enters the lake's northeast corner.

The Swan River originates in the Mission Mountains and has a total length of 84 miles. A number of natural lakes are located on the Swan River, the largest of which is Swan Lake with a surface area of 2,680 acres. Bigfork Dam, a relatively small structure located 1.5 miles above the mouth of the Swan River, impounds approximately one mile of the river.

Figure 1. Map of Flathead River drainage.

The lower Flathead River drains Flathead Lake near Polson, Montana. The river flows 76.5 miles before emptying into the Clark Fork River near Paradise, Montana. Kerr Dam is located on the Flathead River 4.5 miles below the lake outlet. Kerr Dam adds a maximum of 10 feet of elevation to Flathead Lake.

Several potential hydroelectric sites are located on the lower Flathead River. Knowles Dam site is located at river mile (RM) 2.7. Other sites include Buffalo Rapids number four at RM 36.5, Sloan Bridge at RM 44, Buffalo Rapids number two at RM 61 and Moiese, located between Knowles and Buffalo Rapids number four.

Hydrology

The Flathead drainage is a water-rich basin, compared to other inland western river basins. The basin produces approximately 1,000 acre-feet of surface runoff per square mile of drainage area (Montana Department of Natural Resources and Conservation 1976). The drainage encompasses 8,446 square miles of which 7,096 square miles are located upstream of Kerr Dam (Montana Department of Natural Resources and Conservation 1977). Four hundred thirty-three square miles (five percent) of the basin is located in British Columbia.

Peak runoff normally occurs in May or June throughout the drainage. Water is stored in Hungry Horse Reservoir and Flathead Lake during the runoff period, dampening peak flows. Mean annual discharge and extremes for the Flathead River and major tributaries are listed in Table 1.

Seasonal discharge and temperature patterns in the North, Middle and upper South Forks reflect the climate of the upper basin. Minimum stream flows and water temperatures occur in winter. Ice formation is common. Peak temperatures normally occur in late July.

Flows in the lower South Fork are controlled by releases from Hungry Horse Dam. Flows normally range from 145 cfs to 10,000 cfs. Vertical water level fluctuations can be as much as eight feet. Water temperature of the lower South Fork is approximately 40° F year around because water passing the turbines at Hungry Horse Dam is taken from a great depth.

Hungry Horse Reservoir is one of the major storage projects in the Columbia system, storing 3,468,000 acre-feet of water for hydroelectric energy and flood control. The reservoir covers 23,750 acres and has a maximum depth of 500 feet. Surface temperatures normally approach 68° F in summer. Complete ice cover is common in winter.

The main stem Flathead River between the mouth of the South Fork and Flathead Lake is partially regulated by Hungry Horse Dam. Flow and temperature conditions result from the combined action of natural flows and temperatures in the North and Middle Forks and regulated flows and temperatures in the South Fork. Effects of regulation are least noticeable in spring, when natural stream flows are highest. Vertical water level fluctuations of up to five feet can occur in the main stem in fall and winter when natural flows are low. Main stem water temperature can be cooled as much as 14° F in summer and warmed as much as 7° F in winter due to peaking operations at Hungry Horse Dam (Graham et al. 1980b).

Table 1. Mean annual discharge and extremes for the periods of record at U.S. Geological Survey gauging stations on the Flathead River and major tributaries (U.S. Geological Survey 1980).

Station	Discharge (cfs)			1979 Temperature Range
	Mean	Maximum	Minimum	
North Fork near Columbia Falls	2,990	69,100	198	32-65
Middle Fork near West Glacier	2,948	140,000	<173	32-68
South Fork near Hungry Horse	3,571	46,200	7[1/]	37-45
Flathead River at Columbia Falls	9,753	176,000	798	32-66
Whitefish River near Kalispell	192	1,580	4	32-76
Stillwater River near Whitefish	336	4,330	40	32-71
Swan River near Bigfork	1,166	8,890	193	32-73
Flathead River near Polson	11,740	82,800	7[2/]	32-73

[1/] Minimum recorded during closure of Hungry Horse Dam

[2/] Minimum recorded during closure of Kerr Dam

Bigfork Dam has little effect on discharge or water temperature in the Swan River. Most of the flow in the lower mile of the river is diverted through the turbines in low flow periods, but water temperature is essentially unchanged because of the small reservoir storage capacity. Swan Lake has a warming effect on the river downstream. Maximum recorded water temperature for the Swan River downstream and upstream from the lake is 73 and 67° F, respectively.

Flathead Lake is a large, comparatively shallow, oligotrophic lake. Maximum depth is 371 feet. At least two smaller lakes in the drainage are deeper (Potter 1978). Surface temperatures commonly exceed 68° F in summer. Ice cover is common in bays but the entire lake is ice covered only once in ten years, on the average (D.A. Hanzel, Montana Department of Fish, Wildlife and Parks, Kalispell, Montana, personal communication). Water level of Flathead Lake fluctuates 10 feet annually as a result of Kerr Dam operations. Minimum levels normally occur in April while maximum level is maintained from July through September.

Operation of Kerr Dam can result in daily water level fluctuations of six feet in the lower Flathead River. Temperature of the lower Flathead is unaffected by Kerr operations; however, Flathead Lake has a natural warming effect on the lower Flathead River. Maximum water temperature in 1979 upstream and downstream from Flathead Lake was 67 and 73° F, respectively.

The lower Flathead River originates at the Southern tip of Flathead Lake at Polson, Montana, and flows south and west approximately 72.4 miles to its confluence with the Clark Fork River near Paradise, Montana. Approximately 68.6 miles of the river are within the exterior boundary of the Flathead Indian Reservation. Kerr Dam, the only existing impoundment in the lower Flathead River, is a hydroelectric facility located 4.3 miles downstream from Polson, Montana. The dam divides the Flathead River into upper and lower sections. The lower Flathead River drainage encompasses an area of about 2,400 square miles. The first four miles of the river below Kerr Dam are characterized by a fairly steep gradient of about 16 feet per mile. The next 40 miles downstream have a gradient of only 3.4 feet per mile with riffle and pool areas blended together in a comparatively smooth flowing river. The remaining stretch of river has even less gradient (1.5 feet per mile) with a few riffles.

The river between Kerr Dam and Buffalo Rapids has an average width of 375 feet and flows in a single channel through a narrow canyon. Deep pools and several sets of rapids are present. This section of river is subject to severe water level fluctuations as a result of hydropower peaking operations at Kerr Dam. Water levels at the U.S. Geological Survey gauging station downstream from Kerr Dam often fluctuate from two to eight feet in a very short period of time.

From Buffalo Rapids downstream to a point approximately 6.3 miles above Dixon, the river remains in a single channel with only a few small islands present. This stretch of river averages 420 feet in width. The banks are generally steep with benchlands beyond. High clay cliffs are common in this stretch. Water level fluctuations are less than upstream but they may vary as much as one foot in six hours at the bridge near Dixon, Montana.

From 6.3 miles above Dixon to the reservation boundary, the river no longer maintains its single channel appearance, but is broken up by many islands. Numerous sloughs and backwaters are also found in this section. The average width for this section of river is 223 yards. The water is slow moving. The immediate shoreline tends to be steep as do the hills and benchland beyond.

Because of the discharges through Kerr Dam, water fluctuations downstream are often extreme and sudden. The water level may rise or drop two feet in one or two hours. Such fluctuations occur two or more times a day. During the low water months, a considerable amount of river bottom is exposed and reflooded with each of these extreme fluctuations.

Recreation Use

Outdoor recreational opportunities in the Flathead drainage are diverse. Fishing, hunting, hiking, river floating, sailing and water skiing are widely practiced. Extensive river floating by private parties and commercial outfitters occur on all river segments classified under the Wild and Scenic River Act (McLaughlin et al. 1981). Hiking and camping occur throughout the upper drainage, but especially in Glacier National Park, the Bob Marshall and Great Bear Wilderness areas, Mission Mountain primitive area and Jewel Basin. Glacier Park alone attracts well over one million visitors per year.

Fishing is probably the most popular outdoor activity in the upper drainage. Hanzel (1977) estimated 230,976 hours of fishing pressure were expended in the drainage above Flathead Lake in 1975. Fishing pressure on Flathead Lake averaged 123,000 angler-days per year between 1962 and 1964 (Robbins 1966). Fishing pressure is probably higher now. A comprehensive creel census, recreation and economic study of Flathead Lake and a portion of the upper drainage is in progress. The economic value of fishing in the upper Flathead drainage is estimated to be between $2.5 million and $10.5 million annually (Graham et al. 1980a).

Fish and Wildlife Resources

Although several exotic fish species have been introduced in the Flathead drainage, the three forks of the Flathead River still support excellent native fish populations. Westslope cutthroat trout, bull trout and mountain whitefish comprise the overwhelming majority of game fish present in the upper drainage (Montana Department of Fish and Game 1979; Graham et al. 1980c; Fraley et al. 1981). Resident and migratory populations of all three species are found in the drainage.

Cutthroat trout and bull trout are seasonally abundant in the upper Flathead River. Mountain whitefish is the most abundant resident fish species in the upper Flathead, but the river also serves as an important migration corridor for adult and juvenile cutthroat and bull trout (Huston and Schumacher 1978). Kokanee utilize the main stem and portions of the upper drainage for spawning (Graham et al. 1980a). A small, but possibly expanding, population of resident rainbow trout is also present (McMullin and Graham 1981).

Kokanee, bull trout, lake trout and cutthroat trout are the most sought after gamefish in Flathead Lake. Many other species are present.

Whitefish is the most abundant game species in the lower Flathead River. The fish population in this reach of river is dominated by squawfish and largescale suckers. Northern pike and largemouth bass are present in the lower section of this reach. Tributaries to the lower Flathead provide a fishery for westslope cutthroat trout, whitefish, rainbow trout and brook trout. The Jocko River is perhaps the most important tributary in this reach (Peterson 1979, Domrose 1970). A complete list of fish species and their relative abundance is given in Table 2.

The basin is widely known for its big game hunting. Elk, mule deek, whitetail deer, moose, mountain goat, bighorn sheep, black bear, grizzly bear, and mountain lion are big game species currently hunted in the basin. Numerous species of upland game birds are also hunted. Most important among these are blue, ruffed, and spruce grouse; hungarian partridge, and pheasant. Several species of mammals classified as furbearing and/or predatory animals are hunted and/or trapped for their pelts. Notable among these are mink, muskrat, marten, beaver, otter, wolverine, bobcat, lynx, coyote, and weasel. Many species of waterfowl inhabit the basin or stop here during migration and provide substantial hunting recreation. In addition, a large number of nongame animals inhabit the basin, including some classified as rare or endangered. The latter includes the northern rocky mountain wolf, bald eagle, and peregrine falcon.

Table 2. Distribution and relative abundance of fish species in the Flathead River drainage (U.S. Department of Interior, Fish and Wildlife Service 1979; Graham et al. 1980c).

Common name	Scientific name	Distribution[a]	Abundance[b]
Westslope cutthroat trout	*Salmo clarki lewisi*	4	A
Yellowstone cutthroat trout	*Salmo clarki bouvieri*	1	R
Rainbow trout	*Salmo gairdneri*	4	U
Brown trout	*Salmo trutta*	3	R
Bull trout	*Salvelinus confluentus*	4	A
Lake trout	*Salvelinus namaycush*	2	A
Brook trout	*Salvelinus fontinalis*	4	U
Kokanee	*Oncorhynchus nerka*	4	A
Coho salmon	*Oncorhynchus kisutch*	2	X
Mountain whitefish	*Prosopium williamsoni*	4	A
Lake whitefish	*Coregonus clupeaformis*	2	A
Pygmy whitefish	*Prosopium coulteri*	2	A
Arctic grayling	*Thymallus arcticus*	1	R
Northern pike	*Esox lucius*	4	U
Yellow perch	*Perca flavescens*	4	A
Largemouth bass	*Micropterus salmoides*	2,3	A
Smallmouth bass	*Micropterus dolomieui*	2	X
White crappie	*Pomoxis annularis*	2	X
Black bullhead	*Ictalurus melas*	2	U
Pumpkinseed	*Lepomis gibbosus*	2,3	U
Northern squawfish	*Ptychocheilus oregonensis*	4	A
Peamouth	*Mylocheilus caurinus*	4	A
Redside shiner	*Richardsonius balteatus*	4	A
Longnose dace	*Rhinichthys cataractae*	3	R
Longnose sucker	*Catostomus catostomus*	4	U
Coarsescale sucker	*Catostomus macrocheilus*	4	A
Slimy sculpin	*Cottus cognatus*	4	U
Mottled sculpin	*Cottus bairdi*	1	R

[a] 1 = above Flathead Lake, 2 = Flathead Lake, 3 = below Flathead Lake, 4 = entire drainage

[b] A = abundant, U = uncommon, R = rare, X = introduced but no longer present

HUNGRY HORSE AND HUNGRY HORSE REREGULATING PROJECTS

Project Description

Hungry Horse Dam is a high-head project located on the South Fork Flathead River, approximately 10 miles northeast of Kalispell, Montana. The Bureau of Reclamation began construction of the dam in 1948. Storage was begun in 1951, construction completed in 1953 and the reservoir filled in 1954. The dam is a concrete arch gravity structure, 564 feet high, with a crest length of 2,115 feet. Head at the powerhouse ranges from 398 feet to 488 feet within the range of normal operations. The powerhouse has a nameplate capacity of 285 MW but is operated at 328 MW.

The 35-mile long reservoir covers 23,750 acres. Maximum depth is 500 feet. Hungry Horse stores 3,468,000 acre-feet of water, of which 2,982,000 acre-feet is active storage. The storage ratio (active storage to average annual runoff) is large, 1.27 years. Thus, Hungry Horse can be operated in a cyclic manner, with drawdown to minimum pool lasting more than one season. In practice, however, it is operated to refill each year.

The Hungry Horse Reregulating Dam is proposed to accompany expansion of power capacity at Hungry Horse Dam. The 51-foot high proposed dam would impound 3.4 miles of the South Fork Flathead River. The reservoir would contain an estimated 1,950 acre-feet of storage. It is not known at this time if electrical energy would be produced at the reregulating dam. The dam would be operated to reduce water level fluctuations in the main stem Flathead River (U.S. Water and Power Resources Service, 1981). Potential water level fluctuations will increase if any of the Hungry Horse added power alternatives are realized. The alternatives are:

1. Existing condition (328 MW, hydraulic capacity = 11,420 cfs).
2. Uprate existing generators (385 MW, hydraulic capacity = 12,060 cfs).
3. Powerhouse addition (383 MW, hydraulic capacity = 13,370 cfs).
4. Uprate and powerhouse (440 MW, hydraulic capacity = 13,783 cfs).

Project Operation

Hungry Horse is one of four major storage projects in the Columbia River Basin, along with Libby, Dvorshak and Grand Coulee in the United States, Hungry Horse is unique in that it literally sits at the top of the system. Water released from Hungry Horse Reservoir passes through 20 power plants on its journey to the Pacific Ocean. Slightly less than one billion kilowatts of electrical energy are produced at Hungry Horse annually. The water released from Hungry Horse, however, produces another 4.6 billion kilowatts at downstream power plants. Simons and Roribaugh (1971) reported 1,700 kilowatts are produced with each acre-foot of Hungry Horse water, more than any other dam in the system. Because of its position, Hungry Horse is often the first project called upon to make up the difference when problems occur at another power plant. Hungry Horse operation is normally cyclic (up on weekdays, down on weekends), but when problems occur within the power grid, Hungry Horse may operate at full capacity 24 hours per day.

At the present time, there are no constraints on operation of Hungry Horse Dam related to fish and wildlife.

History of Fish and Wildlife Resources

Fisheries

Prior to impoundment by Hungry Horse Dam, the South Fork Flathead River supported spawning migrations of westslope cutthroat trout, bull trout and mountain whitefish from Flathead Lake and the Flathead River. Fluvial cutthroat (fish that resided in the South Fork and spawned in tributaries) as well as tributary resident cutthroat populations were also found.

Since impoundment, adfluvial (fish that reside in a lake or reservoir and spawn in tributaries) populations of cutthroat and bull trout have developed in Hungry Horse Reservoir. Fluvial and resident populations are still found in the drainage above the reservoir.

Wildlife

Very little data on pre-impoundment wildlife distribution or population levels have been recorded. Therefore, most of the impacts of the Hungry Horse Project are based on discussions with Montana Department of Fish, Wildlife and Parks biologists and their assessment of impacts that would occur if similar, adjacent areas were flooded.

Two early reports reflect the distribution and numbers of elk wintering in the area flooded by Hungry Horse Dam, and give an indication of the magnitude of the impacts this project had on this species. A March, 1951 aerial census counted 182 elk in about the lower two-thirds of the area that was later flooded (McDowell and Sylvester 1951). A subsequent report (Marshall 1954) reported that wintering elk in the South Fork of the Flathead were, for the most part, confined to river and creek bottoms and to south and west facing slopes. Wind-bared ridgetops were also used below Spotted Bear. Based on the area of occupied winter range and number of elk observed, Marshall (1954) calculated a winter density of 16.8 elk per square mile.

Impacts on Fish and Wildlife

Fisheries

Construction of Hungry Horse Dam cut off the South Fork to migratory fish in the rest of the Flathead drainage. All of the major game fish species in the drainage (westslope cutthroat trout, bull trout, kokanee and mountain whitefish) are migratory. Contribution from over 38 percent of the tributary drainage area above Flathead Lake was lost with construction of Hungry Horse, resulting in an estimated loss of as much as 60 percent of the spawning by cutthroat and bull trout to Flathead Lake (Graham 1980).

The environment of the main stem Flathead River below its confluence with the South Fork was also altered by Hungry Horse. Peak spring flows were lowered as South Fork run-off was held back to fill the reservoir. Summer, fall and winter flows began to fluctuate in response to South Fork flows. Hypolimnial release of water from Hungry Horse Dam altered temperatures in the South Fork and main stem. South Fork temperatures remain near 40° F year around. Summer temperatures in the main stem are cooled by South Fork inflow. When Hungry Horse powerhouse operates at peak capacity, water temperature in the main stem can be lowered as much as 15° F. In winter, South Fork inflow can warm the main stem as much as 8° F. Changes in temperature caused by operation of Hungry Horse Dam affect aquatic insect development and production, and fish growth. Significant changes in spawning behavior of kokanee, probably related to temperature, also occurred after impoundment of the South Fork.

Timing of the spawning migration of westslope cutthroat trout from Flathead Lake up the Flathead River may have been altered as a result of changes in flow and temperature resulting from discharge from Hungry Horse Dam (Huston and Schumacher 1978). It is hypothesized that flushes of warm water from Hungry Horse in fall and winter may act as a migration cue. Adult cutthroat begin moving up into the river as early as October, although spawning does not occur until the following May or June (McMullin and Graham 1981). It is not known why Flathead cutthroat begin their migration as early as they do, or if the early migration adversely affects reproduction. Timing of cutthroat spawning migrations prior to Hungry Horse Dam is not known.

Juvenile adfluvial cutthroat are also affected by Hungry Horse operations. Until recently, it was thought that juvenile cutthroat leaving North and Middle Fork tributaries in summer went directly to Flathead Lake. During 1980-81, many juvenile cutthroat over-wintered in the main stem Flathead River below its confluence with the South Fork (McMullin and Graham 1981). During winter, the partially regulated portion of the river offers warmer temperatures and probably more food than either the upper drainage or Flathead Lake. In the nearly 30 years since impoundment, cutthroat may have adapted to the use of the river as a wintering area. However, migratory behavior of juvenile cutthroat prior to Hungry Horse Dam is not documented.

Impacts of Hungry Horse Dam upon cutthroat trout in the Flathead system are complex. Juvenile and adult phases of cutthroat life history are affected, but at the present time, it is not known if flow and temperature fluctuations caused by Hungry Horse Dam are detrimental. Some impacts may be beneficial.

Bull trout life history is similar to that of cutthroat. Flow and temperature fluctuations undoubtedly affect bull trout in some manner, but there is not evidence to suggest that bull trout life history has changed as a result of Hungry Horse Dam. The major impact on bull trout of

Hungry Horse was the loss of spawning and rearing habitat. Habitat loss may have been greater for bull trout than cutthroat. Bull trout utilized the entire South Fork drainage while migratory cutthroat were probably limited to the area below Meadow Creek Gorge (Huston 1973a).

Kokanee are affected more directly by Hungry Horse operations than any other species in the drainage (McMullin 1980). Prior to construction of Hungry Horse Dam, most kokanee spawned along the shores of Flathead Lake, in the Whitefish River and McDonald Creek, streams that drain large lakes (Stefanich 1952; 1953a; 1954). Few, if any, kokanee spawned in the main stem Flathead River. After Hungry Horse Dam began operations, a shift from lakeshore spawning to river spawning was noticed (Hanzel 1964). It was hypothesized that water temperatures during the spawning and early incubation stages were too cold in the Flathead River prior to Hungry Horse Dam to allow adequate survival. The warming effect of Hungry Horse water releases encouraged kokanee egg survival. Favorable discharge regimes in the early years of Hungry Horse operation resulted in increased river production of kokanee. At the same time, lakeshore spawning was decreasing (Graham et al. 1980a).

Throughout the early 1960's, flows in the Flathead River during the kokanee spawning and incubation period were nearly ideal for egg survival. Flows during the incubation period (December-March) were nearly always as high or higher than flows during the spawning period (November). Production from river spawning areas more than made up for the lack of lakeshore spawning and by the late 1960's, the total population of kokanee was probably at a maximum. No population data are available, but average length of kokanee spawners was the smallest recorded from 1966 through 1968. Density-dependent growth of kokanee is well documented in scientific literature (Foerster 1944, Bjornn 1957, Johnson 1965, Goodlad et al. 1974, Stober et al. 1978).

Hungry Horse operations changed dramatically beginning in water year 1967. Flows during the spawning period were generally high. Incubation period flows were generally lower, resulting in dewatering of eggs deposited in the river gravels. Mortality of eggs due to freezing and desiccation occurred. The kokanee population declined from maximum levels of the 1960's and average size increased. By the late 1970's, Hungry Horse operations resulted in worst case conditions for kokanee egg survival. In 1980, very few kokanee redds were found in the Flathead River and the average length of spawners was the largest observed during the period of record in the Flathead drainage (McMullin and Graham 1981).

The problem with Hungry Horse operations during recent years is that drafting of the reservoir for power and flood control begins in early fall. Consequently, flows during the kokanee spawning season are nearly always high. Through the winter, Hungry Horse discharges are determined by snow pack and run-off forecasts. Some dewatering of eggs invariably

occurs and often periods of dewatering are extended (Graham et al. 1980b). Critical periods usually occur in January and February when forecasts are less reliable, weather is severe and eggs can tolerate very little dewatering (McMullin and Graham 1981).

The proposed Hungry Horse Reregulating Dam would flood most of the remaining South Fork Flathead River below Hungry Horse Dam. The lower South Fork fishery is of little value except for a small run of kokanee. Present studies suggest a reregulating dam would benefit main stem Flathead River fish populations by reducing the magnitude and timing of water level fluctuations (Graham et al. 1980b, McMullin and Graham 1981). The exact storage capacity of the reregulating dam must be determined before evaluation can be completed.

The most important problems facing the fish population of Hungry Horse Reservoir are barriers to migration of spawning cutthroat and bull trout at road crossings of tributary streams and the timing and extent of reservoir drawdown. When Hungry Horse Dam was constructed, perimeter roads were built on both sides of the reservoir. Where the roads intersected tributary streams, most streams were routed through culverts. Most of the culverts were poorly installed and resulted in barriers to cutthroat and bull trout spawners (Gaffney 1959a; Huston 1964).

Drawdowns exceeding 85 feet in Hungry Horse Reservoir appear to reduce survival of cutthroat trout (Huston 1969a). Drafting of the reservoir during the recreation season limits boat access (Huston 1975a). Limited access is partially made up by improved fishing success, probably due to crowding of fish into a smaller area (Huston 1971a).

Wildlife

In excess of 25,400 acres (approximately 39.75 square miles) were cleared of all timber, brush and snags from the reservoir area prior to flooding (U.S. Department of Interior, Bureau of Reclamation 1958). From this it can be seen that local wildlife populations were severely impacted. This impact was almost entirely negative, the degree varying with the species involved.

Severe losses of yearlong habitat were suffered by species such as white-tailed deer, black bear, mountain grouse, beaver, muskrat, mink, otter and a wide variety of nongame wildlife. Significant losses of spring through fall grizzly bear range also occurred. Moderate losses of yearlong habitat were sustained by bobcats and most other furbearers not mentioned above. Losses of winter elk range were described as moderate, being lessened by the fact that only part of the winter range occurred in stream bottom habitats. Similarly, declines in mountain lion numbers were rated as moderate, primarily occurring in winter and spring and being the result of a declining prey base, primarily white-tailed deer.

Migrating waterfowl, especially fall migrants, received a moderate positive influence through the provision of resting areas. Waterfowl nesting probably declined slightly following impoundment, possibly being a major impact on harlequin ducks which occupy this area, but whose breeding densities are not great anywhere.

The Hungry Horse reregulating dam and reservoir both would be small, with the reservoir projected to have a surface area of 88 acres. Yearlong resident wildlife found in the area that would be flooded include white-tailed deer, ruffed grouse, otter, beaver, mink, muskrat, raccoon, some waterfowl species and a wide variety of nongame birds and mammals. Seasonal residents and/or migrants that would be affected include mule deer, elk, black bear, bald eagles, some waterfowl species and many nongame animals as well.

A big game migration route reportedly crosses the South Fork of the Flathead just below Hungry Horse Dam (U.S. Water and Power Resources Service 1981). A few mule deer and white-tailed deer winter in the area of the planned impoundment northwest of Whelp Creek and southerly along the west facing aspect. The U.S. Water and Power Resources Service (1981) also reports that although bald eagles winter in the area, there is no evidence of eagle nesting along the South Fork in the immediate vicinity of the proposed project. However, Flath (Montana Department Fish, Wildlife and Parks, Bozeman, Montana, unpublished data) notes several active bald eagle nests within a 20-30 mile radius of the proposed reregulating dam, including one along Hungry Horse Reservoir 10-12 miles upstream from the dam. This nest was active and fledged two young in both 1980 and 1981. This suggests that the bald eagle may have been dismissed too hastily and that more consideration may need to be given to it in planning for this project. Additional study would probably be required to determine their status in the general vicinity of the proposed project.

The U.S. Water and Power Resources Service (1981) further suggests that modification of flows by the reregulating dam and reservoir would slightly improve the stability of ecological systems downstream, resulting in small increases in suitable wildlife habitat and riverine wildlife populations, especially for beaver and muskrat. Although water level fluctations would be generally reduced from present conditions, their report further shows that with this project, fluctuations at Columbia Falls will average 1.0 to 1.4 feet during October and January, respectively, with maximums of 4.0 and 4.9 feet for the same months (U.S. Water and Power Resources Service 1981). The latter figure is the same as the current January maximum, and it is not likely that beaver and muskrats will be able to successfully cope with even the average water level fluctuations given.

Though the impacts of this project on wildlife would be almost entirely detrimental, they would be of limited magnitude simply because of the relatively small size of the planned impoundment. These impacts would have to be balanced with the potential positive impacts on the fishery.

Mitigation of Project Impacts

No mitigation measures were specified during the construction of Hungry Horse Dam.

Cooperative programs between the Bureau of Reclamation, U.S.D.A. Forest Service and Montana Department of Fish and Game alleviated fish passage problems in many creeks (Huston 1964; 1970a; 1975a). Fish passage problems regularly reoccur, however, as stream hydraulics change and culverts again become impassable. A major flood could make many streams impassable again (Joe Huston, Montana Department of Fish, Wildlife and Parks, Kalispell, Mt. personal communication).

Since 1976, the Bureau of Reclamation has funded studies by the Montana Department of Fish, Wildlife and Parks to determine impacts of Hungry Horse operations on fish and insect populations in the Flathead River. Studies since 1979 have been part of Appraisal and Feasibility studies for increased power production at Hungry Horse Dam and a proposed reregulation dam downstream.

Construction of the Hungry Horse project was completed with no mitigation for losses of wildlife values being carried out. In addition to losses directly attributed to flooding, building of roads down each side of the reservoir area in order to clear the area to be flooded provided access that hastened the logging of much of the drainage area of the South Fork of the Flathead. This has had further negative impacts on many wildlife species.

Management Goals and Objectives

Fisheries

The fish program goal is to perpetuate aquatic species and their ecosystems and meet the public demand for fish in state waters. To meet this goal, aquatic communities and their habitat must be preserved, protected and enhanced where feasible. Management is designed to equitably distribute angling opportunity.

Quality habitat is the key to fish populations. Preservation and protection of present habitat and restoration of degraded habitat (where feasible) is a very high priority. Fish habitat and populations should be managed on a drainage wide basis. For example, small tributaries used for spawning, larger streams used as fish passageways and large rivers used for rearing are interrelated and must all be preserved to maintain migratory populations of fish that are common in Montana. Important components of fish habitat which must be maintained include water quality, water quantity, physical integrity of stream channels and lakeshores, stream and lakeside vegetation, and adequate passage for migratory fish.

Bull trout, westslope cutthroat throut and kokanee are the major game species in the Flathead drainage. All three species are migratory and consequently, the entire upper drainage must be treated as a unit. Trout and salmon reside in Flathead Lake, but use tributary streams as nursery and/or spawning areas. Because major game species utilize the entire river-lake system, an ecosystem approach to management is necessary.

All fish species in the upper Flathead drainage are affected by operation of Hungry Horse Dam and Kerr Dam, but kokanee are affected most directly. Just as Hungry Horse and Kerr Dams are operated in concert with the other components of the Northwest power grid, their operation has a combined effect on fish populations.

Hydro-related management objectives in the Flathead drainage are:

1. To document the effects of Hungry Horse and Kerr Dam's operations on spawning, incubation mortality and growth of kokanee; and

2. To develop recommendations leading to a balanced operation of Hungry Horse and Kerr Dams that will optimize kokanee production and recreational opportunity in the Flathead system.

Optimum production and recreational opportunity is defined as an angler harvest balanced between total catch and size of fish. Graham et al. (1980a) estimates an annual catch of 500,000 to 600,000 kokanee with an average total length of 12 to 13 inches would meet the objective. Population size and length of kokanee are closely linked by a complex density-dependent relationship (Johnson 1965; Rieman 1979).

Wildlife

To protect, maintain and enhance the available supply of all species of wildlife and their habitat in the project area in order to meet the demand for all types of wildlife-oriented recreational pursuits.

Recommendations to Protect, Mitigate and Enhance Fish and Wildlife Resources

Fisheries

1. Hungry Horse Dam should be operated to insure successful reproduction of kokanee in the Flathead River as follows (1.1.1):

Spawning: *Flow at Columbia Falls should be not less than 4,000 cfs and not more than 4,500 cfs between the hours 1700 and 2400 throughout the spawning season (October-November). From 2400 to 1700 hours, the flow may exceed 4,500 cfs but should never be less than 2,500 cfs.*

Incubation: *A minimum flow of at least 2,500 cfs at Columbia Falls should be maintained 24 hours per day from December 1 through March 31.*

Emergence: A minimum flow of not less than 4,000 cfs at Columbia Falls should be maintained 24 hours per day from April 1 until combined flows of the North and Middle Fork Flathead River exceed 4,000 cfs.

The Flathead Basin kokanee population can be maintained at desirable levels (Graham et al. 1980a) with natural reproduction only if flows during the spawning, incubation and emergence periods are favorable. Excessive mortality of eggs and alevins occurs when flows are high during the spawning period and low during the incubation and/or emergence periods. The recommended spawning flow should provide adequate spawning habitat while preventing kokanee in the Flathead River from spawning in areas subject to severe dewatering. Recommended minimum incubation flows should prevent dewatering of most redds, although some egg mortality due to dewatering could occur. Egg survival should be maintained at levels consistent with Montana management objectives (Graham et al. 1980a). Minimum flows during the emergence periods must be at least as high as spawning flows to insure that fry can successfully emerge from the gravel and migrate downstream. Studies are underway to evaluate what would be the most cost-effective way to provide these flows. Recommendations from these studies should be supported by the Council.

2. *A minimum flow of at least 2,500 cfs in the Flathead River at Columbia Falls should be maintained 24 hours per day from July 1 through October 31 (1.1.2).*

The recommended minimum flow, together with flows recommended for kokanee spawning, incubation and emergence, would essentially establish a year around minimum flow of 2,500 cfs at Columbia Falls. A flow of 2,500 cfs corresponds to the inflection point on the curve of wetted perimeter (the cross-sectional area of stream bottom in contact with water) versus discharge for a transect in the Flathead River near Kalispell, Montana (Figure 2). The curve was generated by the WETP computer program (Nelson 1980a) from data collected in 1980 by the Montana Department of Fish, Wildlife and Parks. The wetted perimeter method of determining instream flow recommendations proved to be the most effective of four methods tested on southwest Montana streams (Nelson 1980b).

Combined fiftieth percentile flows of the North and Middle Fork Flathead Rivers exceed the recommended minimum in July and August (Table 3). During September and October, under median flow conditions, discharge in excess of the present operational minimum (145 cfs) at Hungry Horse Dam would be needed to maintain 2,500 cfs at Columbia Falls. In order to meet the recommended minimum flow at Columbia Falls, flows in excess of the present operational minimum at Hungry Horse Dam would be needed in mid-July under extreme low flow conditions, mid-August under eightieth percentile flow conditions and late August under median flow conditions.

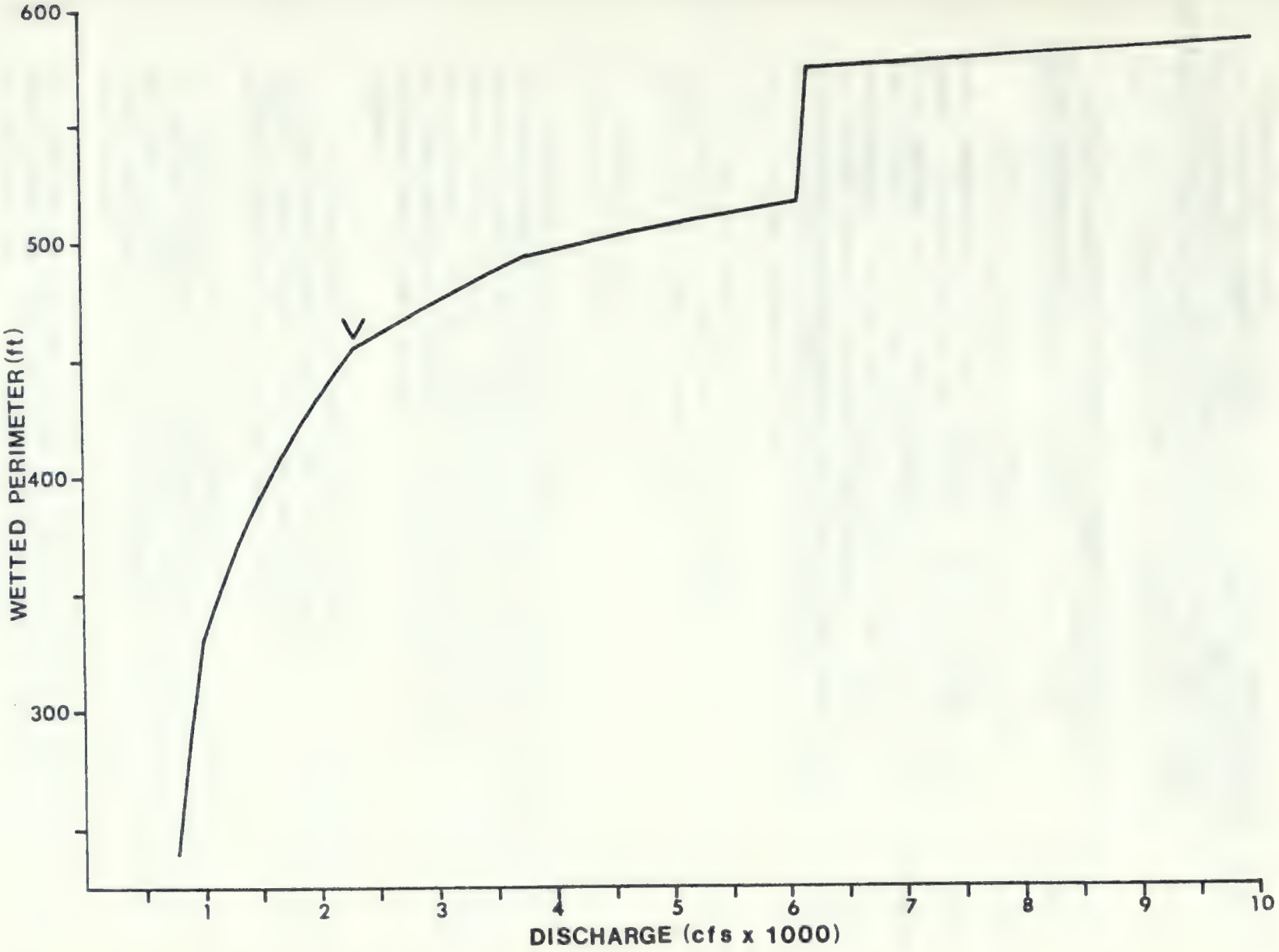

Figure 2. Wetted perimeter and discharge relationship for a cross section of the Flathead River downstream from the South Fork.

Table 3. Fiftieth and eightieth percentile combined North and Middle Fork flows and probability that combined North and Middle Fork flows plus present Hungry Horse operational minimum flow would exceed 2,500 cfs. Based on data provided by Bureau of Reclamation, Boise District office, water years 1929-80.

Month	50th Percentile (cfs)	80th Percentile (cfs)	Probability that flow exceeds 2,500 cfs
July	7,619	4,912	1.00
August	2,909	2,182	0.68
September	1,885	1,554	0.24
October	1,646	1,364	0.34

If the Flathead River was not partially regulated by Hungry Horse Dam, mean monthly flow at Columbia Falls would exceed 2,500 cfs year around (Montana Department of Fish, Wildlife and Parks, unpublished data on file, Kalispell, MT). Table 4 lists mean monthly flows at Columbia Falls for a theoretically unregulated Flathead River.

3. Effects of amount and timing of controlled discharges from Hungry Horse Dam on distribution and migration of kokanee spawners in the Flathead River should be quantified (1.1.3).

Effects of Hungry Horse discharge on kokanee reproductive success under unfavorable flow conditions have been documented (Graham et al. 1980b). Reproductive success under a controlled flow regime could not be documented due to a poor run of kokanee into the Flathead River in 1980 (McMullin and Graham 1981). The controlled flow regime listed in recommendation one represents an estimate of desirable flow conditions for kokanee spawning, incubation and emergence. Spawning site selection is defined by a narrow range of parameters that change with flows. Availability of fish to anglers, as well as reproductive success, could be affected by the recommended flows and should be documented.

A study is under way inpart to further investigate the impact of discharge from Hungry Horse Dam on availability of kokanee on their spawning migration to fishermen in the Flathead River.

4. Construction of a kokanee spawning channel in the South Fork Flathead River should be considered (1.8.1).

A spawning channel could mitigate for the loss of South Fork spawning if Hungry Horse Reregulating Dam is built. A spawning channel would not serve as a substitute for good spawning, incubation and emergency flows in the Flathead River. Controlled flows are designed to restore and maintain a river fishery for spawning kokanee, not simply more fish. Attracting large numbers of kokanee to a spawning channel would contribute to the Flathead Lake fishery but may have only a limited effect on the river fishery.

It is probable that flow conditions requested in recommendation one could not be met every year. Assuming they are met 8 out of 10 years, the spawning channel would insure that some reproduction occurred every year and help stabilize the river and lake fishery.

At this time it is not expected that the channel would be very large. Its purpose would be to supplement not replace main-river spawning. In addition, it would not be desirable to produce too many salmon because a large decrease in average size of spawners would not be acceptable to the fishermen.

5. Critical habitat areas in North and Middle Fork Flathead River tributaries should be protected from any development that could not guarantee the project would not adversely affect gamefish rearing habitat (1.9.1).

Table 4. Theoretical mean monthly flows of the Flathead River at Columbia Falls, assuming the South Fork was not impounded by Hungry Horse Dam. Based on data provided by Bureau of Reclamation, Boise District office, water years 1929-80.

Month	Mean Flow (cfs)
October	3,422
November	3,496
December	3,071
January	2,531
February	2,529
March	2,841
April	11,511
May	33,882
June	33,893
July	12,016
August	4,153
September	2,985

The free flowing portions of the upper Flathead basin are essential components of the basin's ecosystem. The North and Middle Forks and their tributaries provide excellent wild trout fisheries (some critical spawning tributaries are closed to fishing). Of equal importance is the production of gamefish in the upper drainage, upon which the trout fishery of the lower drainage is dependent. Reduced production in the upper drainage would adversely affect the fishery of the entire basin. Montana Department of Fish, Wildlife and Parks is in the process of developing specific instream flow recommendations for the North and Middle Forks. No data has been collected to date for the purpose of establishing instream flows on tributaries of the North and Middle Forks.

Many tributaries of the North and Middle Forks are located in Glacier National Park or wilderness areas. These streams are protected from developments that would degrade habitat. It is unlikely that any dams will be built on these streams. However, much of the critical trout habitat in the upper Flathead drainage is located in unprotected streams, particularly in the North Fork drainage. Because of the migratory nature of the basin's major sport fish, North and Middle Fork tributaries are critical to the entire basin. The importance of North and Middle Fork tributaries to the ecosystem has been magnified since impoundment of the South Fork. Any development, hydroelectric or otherwise, that would restrict migration to or quality of critical habitat areas could have severe impacts on the fisheries of the entire basin. North Fork tributary drainages that merit especially vigorous protection include, but are not limited to, Big Creek, Coal Creek, Red Meadow Creek, Whale Creek and Trail Creek.

6. Drawdown of Hungry Horse Reservoir should not exceed 85 feet (1.2.1).

In-reservoir survival of westslope cutthroat trout appears to be reduced by drawdowns exceeding 85 feet. Poor survival of cutthroat results in reduced angling opportunity in the reservoir. Reservoir drawdown of over 85 feet may be necessary to meet the requested instream flows for the Flathead River. If so, the tradeoffs must be evaluated.

Wildlife

A study should be initiated to assess potential areas where management of wildlife could be considered as mitigation of habitat lost by construction of Hungry Horse Dam and make appropriate recommendations.

Areas flooded are, for all practical purposes, lost forever. Protection of wildlife values is no longer a viable option and there is really no way that operational changes in the project could benefit wildlife in any but the slightest degree. Relatively large-scale expenditures for enhancement of adjacent areas or completely off-site mitigation would be necessary to even partially offset losses already incurred.

The problem statement has illustrated the difficulty in, and lack of mitigation for, losses of wildlife habitat associated with past hydroelectric development. A major difference between the fishery and wildlife impacts is that although hydroelectric development may change the species

composition, productivity, access, or other features of the fishery, some form of a fishery generally remains. Mitigation measures associated with passage, reservoir operation, artificial enhancement, etc. can often offset some of the fishery losses. For wildlife, there is usually a complete loss of habitat resulting from inundation, rip-rap, roading, etc. On-site mitigation is difficult and generally results in purchasing land which is already productive habitat. Without intensive management, this results in a net loss for wildlife, and usually a loss of land in private ownership.

For replacement of lost wildlife values to be realized through habitat improvement, either on-site or off-site, a larger acreage of land will usually be required than that actually flooded, even if intensively managed. This is due to two factors. First, the riparian habitat lost is generally more productive than replacement lands, and second, in most cases the lands to be managed are already occupied and superimposing new populations on those present will require more than a simple acre-for-acre replacement, plus intensive management.

On-Site

Habitat manipulation on project lands to improve food and/or cover for various species of wildlife could help offset some of the wildlife values lost through construction of this project. Species to be managed for and appropriate techniques would have to be determined prior to initiating such practices.

Creation of permanent, relatively shallow water ponds, through construction of dikes to retain water during drawdowns or by trapping water from small streams or springs could benefit many species. Islands that would be above the high water level could be constructed at the same time as dikes, and would provide nesting waterfowl with additional nest sites. Stablization of water levels behind such dikes would allow submerged and emergent aquatic vegetation to establish themselves, along with cottonwoods, willows, etc. along shorelines. This would benefit many species, especially aquatic furbearers and nongame in addition to waterfowl. If deep enough to support fish year-round, such areas might also provide additional and/or better foraging areas for osprey and bald eagles nesting in the vicinity.

Opportunities for on-site improvement of wildlife values on existing projects are limited to project waters and generally narrow land boundaries. As an alternative to on-site activities and/or to further improve the wildlife values in the project vicinity, off-site enhancement of a designated species, or group of species, as compensation for previously unmitigated wildlife losses may be necessary.

Off-site

Loss of wildlife values due to existing hydroelectric developments should be mitigated by acquiring management rights to an agreed quantity of land.

This could be either private, public or a combination of the two. Securing such rights to government owned lands might meet with less public opposition, which often arises when private lands are purchased and removed from local tax rolls. This land would be managed for wildlife benefits, with all other management decisions secondary. This would not require ownership of the land rather a set of requirements that existing or future landowners would relinquish to the fish and wildlife agency. These may include surface easements, mineral rights, water rights, etc. Management rights to these lands should be guaranteed and acquisition begun immediately to reduce the impact of ever escalating costs.

This would not preclude development of the land for timber, agriculture, grazing, or other uses, if conducted in a manner and to the extent that they are compatible with wildlife management objectives. This would leave land in its existing ownership while providing an opportunity to enhance its potential for wildlife production, thereby providing a new gain for wildlife with a minimum of inconvenience to the owner.

Such management rights should be secured for both riparian zones and upland areas impounded. In many areas, the potential for rehabilitating and protecting riparian vegetation is large. The concept is to manage these zones to provide optimum wildlife habitat through selective cutting, fencing, revegetation, increase minimum stream flows, and other techniques. This would not require purchasing the land, but existing scenic easements are not the answer. Management of these zones is necessary to insure that their potential as critical wildlife habitat is sustained over time. Acquiring management rights could result in a range of management decisions from "hands-off" to rehabilitation of severely damaged habitat. Rehabilitating potentially good habitat would have the largest short-term gains. Mitigation measures should also provide the funds necessary to implement management recommendations, and provide for on-going development and operations.

During the planning for any mitigation program, it is necessary to identify the target species the area will be managed for. Regardless of the species managed for, or the methods employed, most habitat management programs for wildlife mitigation purposes should strive for a complex mosaic of many habitats and age classes to result in the greatest benefit for all wildlife. Continued management costs and efforts will usually be necessary to maintain realized benefits of mitigation. The frequency and extent of these costs should be estimated and included in project funding for the expected life of the mitigation project, and extended if necessary.

BIG FORK PROJECT

Project Description

The Big Fork hydroelectric project is located on the Swan River adjacent to the town of Big Fork, Flathead County, Montana. The project was constructed in 1902 by the Big Fork Electric Company with an installed capacity of 360 kilowatts. The project was gradually expanded and sold in 1909 to Northern Idaho and the Montain States Power Company, which merged with the present owner, Pacific Power & Light Company in 1954. The present installed capacity of 4,150 kilowatts was attained in 1928 (Federal Power Commission 1976).

The project includes: a 300-foot long, 12-foot high concrete diversion dam with a 15 pool fish ladder; a 1.5 mile-long reservoir with storage of 109 acre-feet, surface area of 71 acres, and maximum depth at full pool of 18 feet; an intake structure which diverts water into a one mile-long conduit; a powerhouse situated at the downstream end of the conduit, with two 1700 kilowatt generators and one 750 kilowatt generator. The dam is located 1.5 miles upstream from the mouth of Swan River which empties into Flathead Lake. The maximum capacity in the conduit is 500 cfs which conveys water around a one mile reach of stream. Since stream discharge can be below 500 cfs from August through March, the project has the potential to divert the entire stream flow during most years (Federal Power Commission 1976, Pacific Power & Light Company 1977).

Project Operation

The Big Fork Project is operated as a baseload diversion project. The maximum diversion rate is 500 cfs; flows greater than this spill over the concrete dam. Annual flow averages 1,144 cfs. Flow during April through July is normally greater than 500 cfs, while flow can drop below this level the remainder of the year.

Prior to 1976, Pacific Power & Light Company voluntarily released a minimum flow of 25 cfs at a time when spilling ceased. This was provided by the fish ladder and stop-log section in the dam. Beginning in 1977, releases for a minimum flow were increased to 40 cfs (Pacific Power & Light Company 1977).

Beginning in 1963, at the request of Montana Department of Fish and Game, Pacific Power & Light Company released slugs of water (150-250 cfs) from the dam from about 2:00 a.m. to 6:00 a.m. on two or three days a week during the upstream migration of kokanee. Concurrently, plant loading was reduced. The releases of three to four hours duration were made to attract the kokanee from the powerplant tailrace to the one mile section of river below the dam. This proved to be successful in stimulating fish movement past the tailrace and has been continued in subsequent years when needed (Pacific Power & Light Company 1977).

Article 24 in the license issued by the Federal Power Commission (1976) for the Big Fork Project required the operator to "....release adequate flows of water from the diversion dam or through the fish ladder to maintain fish migration and fish habitat." Operational procedures have been adopted by Pacific Power & Light Company to meet the requirements of Article 24 using the best available information.

History of Fish and Wildlife Resources

Bull trout, an important native species, live in Flathead Lake as adults or subadults and migrate into tributaries to spawn (Graham et al. 1980c). The migratory pattern of this species is similar in both the North and Middle Forks of the Flathead River which are the last major tributaries not impounded by dams. Bull trout are found migrating up the lower Swan River (in small numbers) and found throughout the upper Swan drainage (Domrose 1974). Bull trout residing in Flathead Lake probably used the Swan drainage extensively prior to construction of Big Fork Dam in 1902 (Gaufin et al. 1976).

Westslope cutthroat trout, another important native species, also migrate out of Flathead Lake for the purpose of spawning (Graham et al. 1980c). Cutthroat trout migrate up the lower Swan in small numbers (Domrose 1974). Historically, cutthroat trout probably used the Swan drainage extensively for spawning prior to construction of Big Fork Dam (Gaufin et al. 1976).

The first sport fishery for kokanee salmon, an introduced species, was noted in 1933 (Gaufin et al. 1976). Since that time, a significant kokanee spawning run and snag fishery has developed downstream from Big Fork Dam.

A resident rainbow trout fishery exists both upstream from Big Fork Dam (below Swan Lake) and in the one mile reach downstream from the dam. This is one of the few areas in northwestern Montana where a stream fishery exists for this species.

Impacts on Fish and Wildlife

Fisheries

Big Fork Dam is a barrier to bull and cutthroat trout which historically migrated out of Flathead Lake into the Swan River drainage (Gaufin et al. 1976) because of the ineffective fish ladder.

This project has cut off 16 miles of river access from Flathead Lake to Swan Lake and another 59 miles above Swan Lake plus access to numerous tributaries (Domrose 1974). Access is blocked to migrating kokanee salmon, which were not present when the project was built, to potential spawning areas upstream.

The Big Fork Project reduces flows in the one mile reach of river between the dam and powerhouse. The effect of the reduced flows on fish rearing, migration, reproduction, and survival for both resident and migratory fish has not been adequately determined. Species most likely impacted include rainbow trout and kokanee salmon.

Big Fork Dam and Reservoir have prevented new recruitment of small rubble and gravels to the reach of river between the dam and powerhouse. Repeated flood stage flushing has removed all but a few dozen square feet of spawning gravel. The declining kokanee spawning in this area in recent years may be tied to reduced amounts of spawning size gravel (Montana Department of Fish and Game 1977). Other species of fish which may potentially spawn in this reach, particularly rainbow trout, may also be impacted.

Since Big Fork Dam has potential to divert all or most of the Swan River through the powerhouse during periods of low flow, young fish or fish larvae drifting downstream may become entrained or entrapped in the diversion or generators. Older fish migrating downstream may likewise be impacted.

Wildlife

The project flooded an area of 71 surface acres which undoubtedly served as year-long and/or winter range for white-tailed deer, ruffed grouse, furbearers, and a wide variety of nongame wildlife. Additional species such as mule deer, black bear, waterfowl, etc. probably utilized the area on a seasonal or more sporadic basis. Although the impacts of this project on wildlife were almost entirely negative, they were of relatively small magnitude since the amount of habitat lost was relatively small.

Mitigation of Project Impacts

Fish passage facilities were built into the project but were not effective. In 1960, modifications were made in the facilities (increased the number of pools, changed position of the entrance), but again the structure passed only very few game fish (Domrose 1974). To date, significant upstream migration of fish over Big Fork Dam has not occurred.

Prior to 1973, Pacific Power & Light Company released 25 cfs as a minimum instream flow (over Big Fork Dam or through the fish ladder) during periods when flow could be entirely diverted through the powerhouse. In 1977, minimum flows were increased to 40 cfs (Pacific Power & Light Company 1977). Minimum flows normally can occur from September through March. The adequacy of this instream flow has not been quantified for rearing of rainbow trout or for reproduction of kokanee salmon. During years of low flow, discharge from the powerhouse may be much greater than that flowing over the dam into the natural channel. When this occurs during migration periods, kokanee congregate in the tailrace

of the powerhouse. To stimulate kokanee migration upstream to Big Fork Dam, for the purpose of spawning and to provide a snag fishery, Pacific Power & Light Company in 1963 began releasing water (between 150-250 cfs) from the dam from about 2:00 a.m. to 6:00 a.m. on two or three days a week. Concurrently, loading was reduced. This proved to be successful to induce kokanee migration to the dam and has been continued in subsequent years as needed (Pacific Power & Light Company 1977). The effect of the present flow regimen on spawning success of kokanee has not been determined.

In 1978, 100 yards of clean gravel were placed downstream from Big Fork Dam to enhance kokanee reproduction. Another 300 yards of less than one-half to four-inch-sized gravel was added in 1981. The effectiveness of this measure to enhance kokanee reproduction is yet to be evaluated.

The intake structure is not screened to prevent entrapment or impingement of fish, nor has the need for one been evaluated.

Management Goals and Objectives

Fisheries

The fish management goals for the lower Swan River include:

1. Improve kokanee recruitment from the Swan River to maintain or improve the snag fishery downstream from Big Fork Dam and to improve the trolling fishery in Flathead Lake.

2. Provide adequate habitat conditions downstream from Big Fork Dam for rearing and reproduction of resident fish species such as rainbow trout to maintain or improve this resident fishery.

Wildlife

To protect, maintain and enhance the available supply of all species of wildlife and their habitat in the project area in order to meet the demand for all types of wildlife-oriented recreational pursuits.

Recommendations to Protect, Mitigate and Enhance Fish and Wildlife Resources

1. To meet the management goal of improving kokanee reproductive success and the kokanee snag fishery in the Swan River, it is necessary to investigate past mitigation attempts and operations of Big Fork Dam to determine if present practices should be continued, altered, or abandoned. Specific objectives include (1.1.4):

1. Document the effect a minimum flow of 40 cfs has on reproduction and incubation of kokanee salmon.

2. Document the effect a surge flow of 150-250 cfs, during the hours of 2:00 a.m. to 6:00 a.m. two or three days a week, has on migration, spawning and incubation success of kokanee.

3. Continue the practice of adding spawning-sized gravel downstream from Big Fork Dam and document if kokanee reproductive success is improved by this method.

4. Document if kokanee (or other fish) recruitment downstream out of Swan Lake is prevented by diversion through the Big Fork powerhouse and investigate measures to reduce entrainment (if needed).

Positive measures have been taken by Pacific Power & Light Company to improve kokanee reproduction. These measures include providing a minimum flow, providing surge flows over the dam to stimulate kokanee migration past the powerhouse, and placing spawning-sized gravel downstream from the dam. The effectiveness of these measures on kokanee reproduction should be determined. This information will allow decisions to be made whether to continue, modify, or abandon the programs in the future. Perhaps large numbers of kokanee migrate downstream out of Swan Lake but are entrained by the diversion and generators. Field investigations could determine if screening the intake structure is a beneficial measure to increase kokanee (and other game fish) recruitment.

2. Maintain the present minimum flow of 40 cfs between Big Fork Dam and the powerhouse and document if this flow is sufficient to ensure successful reproduction and rearing of resident species such as rainbow trout (1.1.5).

Rainbow trout are residents of the Swan River below Big Fork Dam and provide a unique fishery for this locale in Montana. Investigations should be done to determine if 40 cfs is sufficient to ensure successful reproduction and rearing of rainbow trout.

KERR PROJECT

Project Description

Kerr Dam is a 200 foot high concrete arch structure across Flathead River and is located 4.5 miles downstream from the outlet of Flathead Lake. The dam is located on Confederated Salish and Kootenai tribal lands. Kerr Dam, constructed primarily for hydropower, was closed in April of 1938. The license was amended and transferred from Rocky Mountain Power Company to the Montana Power Company in August, 1938. Three generation units were installed; one in 1939, one in 1949 and the last in 1954. Each unit has a 56,000 kilowatt generating capacity for a total of 168,000 kilowatts. The Kerr project is currently operating under a license which expired May 22, 1980. Montana Power Company and the Salish-Kootenai tribe have filed for relicensing (Federal Energy Regulatory Commission 1980).

Kerr Dam controls the water level of Flathead Lake between elevations 2883 and 2893 feet. This represents a storage capacity of 1,217,000 acre-feet. In most years, spring runoff produces a volume of water which not only refills the storage area, but also causes a continuous discharge over the dam for a month or more. The hydraulic capacity of the three generators is 14,346 cfs while the mean river discharge is 11,730 cfs. Lake elevations are also altered by Hungry Horse Dam upstream from the lake on the South Fork of the Flathead River. Hungry Horse Dam was closed in 1951 (Federal Energy Regulatory Commission 1980).

Project Operations

Operation of Kerr hydroelectric development is coordinated with that of other hydro resources of the Northwest Power Pool. Draft on storage usually begins in mid-September and reaches a maximum drawdown at the end of March or mid-April. In this period, use of storage releases from Hungry Horse Reservoir, together with those from Flathead Lake, makes generation possible at a plant factor of 75 to 80 percent. During remaining months of the year, generation depends on the volume of runoff available in excess of that required to refill reservoirs. In many years, the plant continues to operate at a high plant factor through May and June (Federal Energy Regulatory Commission 1980).

Because of natural channel restrictions between Flathead Lake and Kerr Dam, the maximum rate of discharge through the outlet channel when Flathead Lake is at elevation 2893 feet is 55,500 cfs. The historic rate of inflow has been as high as 176,000 cfs on June 9, 1964.

Because inflow, during periods of high runoff, can greatly exceed maximum outflow, drawdown on storage begins in mid-September to allow for flood control during spring. The maximum rate of outflow at drawdown (elevation 2883 feet) is 5,200 cfs because of natural channel restrictions in the lake outlet. If the plant relays off when not spilling, no flows will be released for a short time.

Montana Power Company relies on the Kerr project for the bulk of its systems load frequency control. This requires changing flow releases through the Kerr project on a very short time basis. This may involve going from a full to minimum load or vice versa in an emergency situation. Other operational constraints to optimize power output through the Kerr plant include filling the reservoir each summer and achieving maximum draft of the lake prior to spring runoff. Operational planning is based on a minimum daily average release of 1500 cfs (Montana Power Company 1981).

Kerr Dam is included in the Pacific Northwest Coordination Agreement. Stipulations in the agreement (Montana Power Company 1981) include:

1. Maintain Flathead Lake elevation in accordance with the energy content curve determined under the agreement. This agreement provides for operation of all major facilities on the Columbia River. The use of the energy content curve provides for maximizing the amount of hydroelectric energy production under most prudent constraints.

2. Operate below the energy content curve only if all reservoirs are at or below their energy content curves.

3. Release stored water above their energy content curves at the request of downstream users or provide "in-lieu" energy to replace the energy the water would have provided if it had been released.

4. Comply with numerous other conditions of this agreement.

On May 31, 1962, the Montana Power Company and the Corps of Engineers stated a "Memorandum of Understanding" which set further principles and procedures for regulation of Flathead Lake in the interests of flood control. This agreement provides that, conditions permitting, the lake will be drawn down to elevation 2,883 feet, the minimum water level under the license, by April 15 and raised to elevation 2,890 feet by May 30 and to elevation 2,893 feet, the maximum level under license, by June 15. When the lake reaches elevation 2,886 feet in a moderate or major flood year, the licensee will gradually open spill gates and not close them until after the danger of exceeding elevation 2,893 feet has passed. This agreement has been endorsed by a group of local landowners and recreationists (Federal Energy Regulatory Commission 1980).

The Montana Power Company currently has no definite plans for further development of the project and proposes to continue past operations. However, several options to increase energy output have been surveyed by government agencies and Montana Power Company. Options include; raising the dam and elevation of the reservoir, enlarging the lake outlet to increase maximum flow rate (at lake elevation 2,883) from 5,200 to 30,000 cfs, rewinding the present generators, and installing an additional generator (Federal Energy Regulatory Commission 1980).

The remainder of this section on Kerr Dam is organized to present the concerns of the State of Montana and U.S. Fish and Wildlife Service on Flathead Lake and address the concerns of the Confederated Salish and Kootenai Tribes on the south half of Flathead Lake and Flathead River downstream from Kerr Dam which fall within the exterior boundary of the reservation. For clarity these sections have been kept separate. The Confederated Salish and Kootenai Tribes also present concerns for the Kootenai River in this section.

History of Fish and Wildlife Resources

Important native gamefish in Flathead Lake include bull trout, cutthroat trout, and mountain whitefish. These species are still abundant and have extensive spawning runs into the North and Middle Forks of the Flathead River, the last major tributaries not impounded. The closure of Hungry Horse Dam on the South Fork of the Flathead River in 1953 eliminated a large portion of the potential spawning tributaries for cutthroat and bull trout into Flathead Lake (Graham 1980; Graham et al. 1980c; Gaufin et al. 1976).

Bull trout provide a significant trophy fishery both in Flathead Lake and in tributaries when on their spawning migrations. Cutthroat trout provide an important fishery throughout the drainage. Mountain whitefish are abundant but not extensively utilized by fishermen (Graham et al. 1980c; Gaufin et al. 1976).

Kokanee provide the largest fishery in both the lake and river. Statewide mail surveys conducted in 1958 and 1975 showed that fishing pressure had doubled in Flathead Lake over that period (Montana Fish, Wildlife, Parks files, Kalispell). A census conducted on the lake from 1962 to 1964 estimated an average of 123,000 fisherman-days per year with kokanee representing 77 percent of the catch (Robbins 1966). Present annual pressure probably ranges from 100,000 to 200,000 fisherman-days per year on the lake (Graham et al. 1980a).

The river fishery was censused in 1975 and total pressure was estimated at 63,123 angler trips (Hanzel 1977). The fall and winter fishery from October to April comprised 45 percent of the total fishing pressure and 72 percent of the total catch. Kokanee were the primary sport fish in the fall and winter fishery.

The kokanee fishery can be classed in three categories. The largest is the lake trolling fishery comprised largely of three and four-year-old kokanee. The fishery is conducted from June through August.

Other fisheries for kokanee occur on their spawning migration and spawning grounds. Snagging of these mature fish with weighted treble hooks is the most common method of capture. This occurs in both river

and lakeshore areas. From September through November, fishermen concentrate on the banks of the main Flathead River and portions of the lower Middle Fork. There are two main runs into the river. An early run in September is probably destined for the springs and lake outlets upstream from the regulated portion of the river. Another run follows in several weeks and probably makes up most of the spawning in the regulated Flathead River.

A snagging fishery also occurs on lakeshore spawning areas. This fishery occurs in the fall and is presently the smallest of the three fisheries. This was not the case historically, however. Following the introduction of kokanee in 1916, a fishery was recognized in the 1930's. Lakeshore snagging of kokanee on their spawning grounds was popular in the 1950's although initial surveys identified the potential problems of lake level drawdown during the incubation and emergence period (Stefanich 1954). Some spawning was also occurring in the river system including lake outlets and spring areas.

In the early 1960's, there was a shift from lakeshore spawning to river spawning (Hanzel 1964). A factor which could have influenced this was the construction of Hungry Horse Dam on the South Fork of the Flathead River in 1953. The warmer fall and winter discharges from Hungry Horse Dam have apparently attracted kokanee and provided conditions for successful spawning although incubation success can be quite variable because of flow fluctuations generated by Hungry Horse Dam. The relationship between this shift in spawning locations and changes in operations of Kerr Dam over the years is not clear.

Lake trout, another introduced species, provide a trolling fishery in Flathead Lake. Lake whitefish, also introduced, are abundant in the lake but are seldom caught. Largemouth bass and yellow perch, both introduced, are locally abundant in the lake and provide a diversified fishery.

Impacts on Fish and Wildlife

Fisheries

Historically, most kokanee spawning occurred along the shores of Flathead Lake with some additional spawning in McDonald Creek and Whitefish River (Stefanich 1952; 1953a; 1954). Later investigations showed a shift from a lake-based spawning population to a river-based spawning population (Hanzel 1964; Huston and Schumacher 1978).

Although the reason for the shift is not entirely clear, it does appear that operation of Kerr Dam may have limited successful lakeshore spawning or changed the historically observed patterns of spawning.

Prior to impoundment by Kerr Dam, water levels in Flathead Lake remained relatively constant from October, the beginning of the kokanee spawning period, through mid-April, when kokanee fry were emerging from shoreline gravels. Lake levels during fry emergence were generally

within one foot of the water level during kokanee spawning the previous fall. Maximum lake levels were reached during spring runoff in May and June (Hanzel 1974).

Since impoundment, maximum water levels have been reached in May and maintained into the fall kokanee spawning period. Minimum water levels have been reached in mid-April, the time of fry emergency. Using November 14 as the approximate time at which kokanee spawn and April 1 as the approximate time of emergency, the following comparisons were made. Lake levels from 1939 (the year Kerr Dam was closed) to 1950 averaged 6.8 feet lower at the time of fry emergency than at the time of spawning and ranged from 1.0 to 9.1 feet lower. Since Hungry Horse Dam operations began in 1952, the mean fluctuation of lake levels have not changed appreciably; however, the range is now 4.2 to 8.5 feet (Graham and Schumacher 1979, Hanzel 1974).

The reduction in lakeshore recruitment of kokanee or a possible shift in timing or location of spawning have resulted in a significant decline in the lakeshore snagging fishery. A lakeshore snagging fishery was observed and censused by Stefanich (1954) and Robbins (1966). Since kokanee exhibit a strong homing instinct in returning to the areas they were hatched, large spawning concentrations are no longer available along the shore because of poor reproductive success in the lake. In recent years, little effort has been expended on snagging kokanee along the lakeshore.

Other important gamefish which spawn in the lake and may be impacted by water level fluctuations are lake trout and lake whitefish. Both of these species are fall spawners and little information is available on their habitat requirements in relation to water levels in the lake. Largemouth bass may also be negatively impacted by delayed filling of the lake in spring. Bass normally spawn in May and later filling dates delay spawning activity.

Wildlife

Impacts of Kerr Dam on wildlife are primarily related to seasonal water level management of Flathead Lake, including the timing of drawdown and refill. A primary concern has been nesting of waterfowl, in particular, Canada geese.

The main concern with nesting geese is fluctuating water levels during late February through April. Nest site selection by Canada geese in this area begins in mid to late February, with actual nesting beginning around March 10 and peaking about March 26. The peak of hatching occurs around April 25, but can extend into late May. Increasing water levels during this period can lead to flooding of low lying nests, while drawdown can expose island nests to mammalian predators.

Drawdown during the October - November period greatly reduces the amount of shallow water area, containing emergent and submerged aquatic vegetation, available to resident and migratory waterfowl. Fall drawdown also affects recreational use of the waterfowl resource by stranding duck and goose blinds with variable but generally large mud flats between blinds and open water.

Another concern is the direct loss of habitat for waterfowl, bald eagle, and osprey production due to erosion of the north shore of Flathead Lake. Since 1961, approximately 450 acres of shoreline and river bank habitats within the boundaries of the U.S. Fish and Wildlife Service's Flathead Waterfowl Production Area on the north shore have been lost to erosion (USFWS 1981). These losses resulted from restablization processes of the lake in response to manipulation of Flathead Lake water levels since the 1939 closing of Kerr Dam. Water level regulation affected sediment buildup, delta formation, and bank and island erosion from wave action which caused the habitat losses.

Mitigation of Project Impacts

To date, operations of Kerr Dam have not included constraints to benefit fisheries. The impact of the operation of Kerr Dam on the fishery of Flathead Lake is not clear and is probably a major reason that changes have not been made to enhance the fishery resource. No mitigation has been attempted for wildlife losses.

Management Goals and Objectives

Fisheries

Kokanee salmon have received the major management emphasis in Flathead Lake because they are the most abundant gamefish, are highly sought after, and provide the bulk of the fishery. For this reason, management goals are directed toward kokanee and include:

1. Provide optimum numbers, maximum distribution of fishable numbers, and a prolonged fishing period of kokanee by increasing the number of lake spawning areas and snagging areas, and increasing the population of kokanee in Flathead Lake.

2. Diversify the fishing opportunity by providing both snagging and an improved lake trolling fishery (by increasing reproductive success) for kokanee in Flathead Lake.

Wildlife

To protect, maintain and enhance the available supply of all species of wildlife and their habitats in the project area in order to meet the demand for all types of wildlife-oriented recreational pursuits.

Recommendations to Protect, Mitigate and Enhance Fish and Wildlife Resources

Fisheries

1. Results from a recently initiated kokanee study should be evaluated to determine measures which could be implemented to improve reproductive success of kokanee in Flathead Lake and provide a good lakeshore snagging fishery (1.2.2).

Funding has recently been secured from the Bonneville Power Administration to investigate the effect of operation of Kerr and Hungry Horse dams on the reproductive success of kokanee in the Flathead River-Lake system (Graham 1981a). The purpose of this study is to improve reproductive success of kokanee spawning in the lake and river to provide a more diverse and successful fishery. To do this, it is necessary to investigate the impacts of lake level fluctuations on the success of kokanee reproduction in Flathead Lake and determine to what extent other factors may have contributed to the decline in the lakeshore fishery. Specific study objectives include:

1. Investigate the effect of operation of Kerr and Hungry Horse dams on water levels in Flathead Lake and quantify effect of amount and timing of drawdown on distribution and reproductive success of kokanee spawning on Flathead Lake.

2. Delineate extent of successful shoreline spawning in Flathead Lake both on-shore (less than 20 feet in depth) and off-shore (greater than 20 feet in depth).

3. Quantify influence of ground water on incubation success of on-shore spawners in Flathead Lake subject to dewatering by lake drawdown.

Wildlife

Losses of production of waterfowl, bald eagles and osprey on Flathead Lake as a result of construction and operation of Kerr Dam should be estimated and, if necessary, a study should be funded to do so. Compensation for those losses may include providing artificial nest sites, especially islands that would be above the high water level, diking shallow water areas and erecting nesting platforms for raptors.

Amount of production lost for waterfowl, bald eagles and osprey on the U.S. Fish and Wildlife Services Flathead Waterfowl Production Area should be determined. Efforts to mitigate these losses would consist of intensive waterfowl management on the 2,371 acres of the Flathead Waterfowl Production Area could be used as a means to offset losses associated with lake water level manipulation by Kerr Dam. This management could be directed at increasing nesting opportunities for Canada geese and other waterfowl and bald eagles and osprey by construction of artificial nest

sites, diking shallow water areas, and erecting nesting platforms for raptors.

Nesting sites should be protected against erosion and wave action in some manner (rip-rap, log booms, etc.) to prolong their life. As an alternative, floating and/or elevated nesting structures could be provided.

Delaying drawdown in the fall until sometime in late October or early November would alleviate most of the problems encountered at that time. However, changes in water level management at this time would need to be studied further and coordinated with project operations and operational constraints as well as with upstream water releases from Hungry Horse Dam and with fishery needs which are also affected by operations of these dams. Coordinated mitigation efforts such as this could solve problems for both fishery and wildlife without additional effort and expense. This warrants further exploration.

A study should be initiated to assess the potential areas around Flathead Lake where management of wildlife could be considered as mitigation of habitat lost by construction of Kerr Dam and make appropriate recommendations.

See Hungry Horse Dam - Wildlife Recommendations for a discussion.

SOUTH HALF FLATHEAD LAKE - LOWER FLATHEAD RIVER
CONFEDERATED TRIBES

The Confederated Salish and Kootenai tribes of the Flathead Indian Reservation have actively participated with state and federal Fish and Wildlife Agencies to formulate recommendations to be submitted to the Regional Power Planning Council for incorporation into its program to protect, mitigate and enhance fish and wildlife as mandated by the Pacific Northwest Power Planning and Conservation Act. The Tribes' comments deal primarily with Kerr Dam, the south half of Flathead Lake and the lower Flathead River as these are of greatest importance to the Tribes and are located within the exterior boundaries of the Flathead Reservation.

This draft only addresses current hydropower operation and new information will have to be gathered for any future energy developments. The Tribes understand that the Columbia River Basin Power grid puts constraints on how the operation of Kerr and Hungry Horse dams may be modified for fish, wildlife and recreation.

The following statements are divided into three segments. The first deals with the south half of Flathead Lake, the second deals with the lower Flathead River and the third addresses the Kootenai River. The first two segments include impact, goal, and recommendation statements concerning fish, wildlife, recreation, historical and cultural impacts. The last segment deals with the Tribes' cultural concern on the Kootenai River.

Fisheries-South Half Flathead Lake

Impacts on Fisheries

The species most visibly impacted by the operation of Kerr Dam is kokanee salmon. Initially, most kokanee spawning occurred along the shores of Flathead Lake, however, later investigations showed a shift from a lake based spawning population to a river based spawning population in the major tributaries to Flathead Lake. It is suspected that the operation of Kerr Dam has contributed to this shift in spawning habitat.

Anglers throughout the western United States and Canada visit Flathead Lake to fish for kokanee salmon. Because of a decrease in the number of kokanee salmon spawning along the shores of Flathead Lake, the Confederated Salish and Kootenai Tribes and local businesses have realized a loss in revenue that would have resulted from recreational and subsistence fishing.

Other game fish are affected by drawdowns resulting from the operations of Kerr Dam. How they are affected and the degree to which they are affected is unknown; thus a better understanding is needed for fisheries management. For example, some rearing areas for large mouth bass may be adversely affected by drawdowns. Also, tribal elders expressed there were annual migrations between the lake and the lower river providing excellent fishing at the outlet of Flathead Lake. These migrations stopped with the construction of Kerr Dam.

Fisheries Goal

To perpetuate, enhance and protect the aquatic species to meet both tribal and public needs consistent with the ecological integrity of the ecosystem.

Fisheries Objectives

To protect and enhance game fish populations and habitat to provide optimum recreational and subsistence fishing opportunities in Flathead Lake.

To reach a better understanding of the Flathead Lake fishery and how the different areas of the lake relate to one another.

To maximize kokanee salmon spawning conditions in Flathead Lake, yet minimize the impact on Kerr Dam's operation.

To better understand the operations of Kerr and Hungry Horse Dams so that associated problems may be mitigated.

To protect and enhance water quality.

To provide adequate forage fish population and habitat to meet the requirements of predatory fish and bird populations.

To work with concerned agencies to improve fisheries management.

Fisheries Recommendations

1. To obtain information on the operation of Kerr Dam including extremes in water level manipulation and to correlate this data with fish population needs.

2. To pursue a study to develop a better understanding of the existing and potential fisheries resources in the South Bay, to determine to what extent this shallow bay functions as a separate environment and to what extent it is used by fish species from the main body of Flathead Lake.

3. Kerr Dam should operate in such a fashion as to insure successful reproduction of kokanee salmon and other fish species while at the same time recognition should be given to the economic importance of hydropower to the Confederated Salish and Kootenai Tribes. Water levels within the lake should remain at an elevation which protects lake shore spawning.

4. The Bonneville Power Administration should fund a kokanee salmon study by the Montana Department of Fish, Wildlife and Parks. The Confederated Salish and Kootenai Tribes should provide input for the study design and implementation of results.

Wildlife-South Half Flathead Lake

Impacts on Wildlife

Wildlife may be impacted by energy developments, such as Kerr Dam, in many ways. Water level fluctuations and powerlines are examples. Species of special concern at Flathead Lake are white-tailed deer; fur bearers; bald eagles; osprey; waterfowl, particularly Canada geese; and non-game animals.

Water level fluctuations affect wildlife species both directly and indirectly. Canada geese may have their nests flooded or nesting islands exposed depending on the operation of Kerr Dam. Riparian and emergent vegetation may be either enhanced or eliminated, depending on the degree of water level fluctuations.

Riparian and emergent plants are critical habitat components for wildlife species such as fur bearers, ducks, geese, and swans. Loss of forage fish habitat due to water level manipulation will influence predatory bird populations. Water fluctuations may also affect raptors by changing fish vulnerability. Additional impacts on other species are poorly documented.

Wildlife Goal

To protect, perpetuate, enhance, and manage resident and certain introduced species at population levels consistent with their role in the ecosystem.

Wildlife Objectives

To manage wildlife species such as big game, upland game birds, furbearers, and non-game species at population levels that are consistent with recreational needs, tribal needs, and habitat capacity.

To perpetuate and enhance waterfowl production.

To protect and enhance raptor species, particularly nesting osprey as well as nesting and wintering bald eagles.

To manage predator species at a level consistent with their role in the ecosystem and compatible with surrounding communities.

To work with concerned agencies to improve wildlife management.

Wildlife Recommendations

1. Establish criteria for wildlife population levels and habitat requirements to meet tribal needs, including tribal subsistence hunting. Initiate and complete studies to accomplish this task.

2. *Reduce water level fluctuations during the nesting period for Canada geese and other waterfowl and/or build suitable nesting structures.*

3. *Initiate a population study of bald eagles and their habitat selection during winter to properly manage this endangered species.*

4. *The Confederated Salish and Kootenai Tribes shall continue to participate in recovery plan implementations for threatened and endangered species.*

5. *Study to see if a change is needed in fall water drawdown to accommodate waterfowl hunting while not adversely impacting Kerr Dam operations.*

Recreation-South Half Flathead Lake

Impacts on Recreation

Water level manipulations resulting from the operations of Kerr and Hungry Horse dams impact recreational activities. The shift in kokanee salmon spawning areas has caused a reduction in the number of sport fishermen. This loss has resulted in a negative impact on the economy of the Confederated Salish and Kootenai Tribes and reservation businesses. Waterfowl hunting is negatively affected by water drawdown when mud flats and areas around the shoreline are exposed. In addition, this exposure causes a degredation of the aesthetic quality of the lake.

Recreation Goal

To restore, maintain and enhance, to the greatest extent possible, a diversity of high quality recreational opportunities on the lands and waters impacted by the development and operation of Kerr Dam.

Recreation Objectives

To protect and enhance opportunities for fishing from the shore, by wading and motorized and non-motorized boating at levels necessary to meet public demand along Flathead Lake.

To protect and enhance opportunities for waterfowl and upland game bird hunting on those lands and waters on the Flathead Indian Reservation that are impacted by the development and operation of the Kerr and Hungry Horse Dams.

To protect and enhance opportunities for recreational boating at levels necessary to meet public demand along the lake.

To protect and enhance the high quality aesthetic values found on the Flathead Indian Reservation.

To protect and enhance water quality at levels suitable to insure high quality recreational opportunities.

Recreation Recommendations

1. Harvest data from hunters and fishermen should be obtained to monitor game and fish populations more accurately and formal interviews should be conducted to determine their characteristics and attitudes.

2. Develop methods to obtain baseline information on the timing, amounts, distribution, and types of uses that may affect fish and wildlife resources.

3. Correlate sensitive wildlife areas (waterfowl and raptor nesting sites) with the timing, distribution, and types of recreational uses.

4. Determine the recreational needs of tribal members.

5. Conduct an economic analysis of the value of recreational use.

Historical and Cultural Resources-South Half Flathead Lake

Impacts on Historical and Cultural Resources

The historical and cultural significance of Flathead Lake should not be overlooked. Dr. Carling I. Malouf of the University of Montana made a cultural resources reconnaissance of the Flathead Indian Reservation in 1960. His reconnaissance identified a large number of prehistoric sites on Flathead Lake. Dr. Malouf stated that the area around Flathead Lake and along the lower Flathead River may be the most important center of ancient life in western Montana, and that the entire area is so rich and dense in archeological sites that it could be considered one large site. Based on resource evaluations by Dr. Malouf, these sites probably represent a very significant data base for understanding Montana prehistory and the Native American population of the region. Any loss of these historical or cultural sites due to energy development would be a great injustice.

Historical and Cultural Resources Goal

To record and protect all historical sites and identify cultural needs of the Salish and Kootenai people.

Historical and Cultural Resources Objectives

To establish cirteria which will insure that all historical and cultural sites are protected in the future.

To identify the Indian people's cultural needs and uses of the lower Flathead River in modern times.

Historical and Cultural Resources Recommendations

1. *Interview tribal elders.*

2. *Explore the lake for historical and cultural sites.*

3. *Record, document, and protect sites.*

4. *Protect the Indian people's needs and uses of Flathead Lake in modern times.*

Fisheries-Lower Flathead River

Impacts on Fisheries

The aquatic and riparian habitat downstream from Kerr Dam has been altered by the project's development and operation. When the dam is operated for peaking power, unregulated water level fluctuations adversely affect fish and invertebrate habitat and populations. During periods of extreme water level fluctuations, areas of the riverbed often dry up; aquatic insects and other food chain organisms decrease, adversely affecting the fishery. In addition, water temperatures on the lower Flathead River during the summer months can approach critical levels for salmonids.

Spawning, rearing and adult habitat, and fish migration in the lower Flathead and its tributaries are likely affected by Kerr Dam's operation. These are also problems in tributaries of the lower Flathead due to dewatering, irrigation return flows, water quality degradation and stream barriers.

Present conditions favor rough fish and it is doubtful that significant trout spawning habitat exists in the lower Flathead today, but it may be re-established with proper management. Northern pike and large mouth bass spawn in shallow areas, and consequently reproduction of these species could be adversely affected by the water level fluctuations.

Fisheries Goal

To perpetuate, enhance, and protect the aquatic species to meet both tribal and public needs consistent with the ecological integrity of the ecosystem.

Fisheries Objectives

To protect and enhance game fish populations and habitat to provide optimum recreational and subsistence fishing opportunities.

To reach a better understanding of the Flathead River fishery and how the different areas of the river and tributaries relate to one another.

To optimize northern pike, large mouth bass. and salmonid spawning, rearing, and adult habitat conditions yet minimize the impact on Kerr Dam's operation.

To better understand the operations of Kerr Dam so associated problems may be mitigated.

To protect and enhance water quality.

To provide adequate forage fish population and habitat to meet the requirements of predatory fish and bird populations.

To work with concerned agencies to improve fisheries management.

Fisheries Recommendations

1. To obtain information on the operation of Kerr Dam, including extremes in water level manipulation and to correlate this data with fish population needs and establish desirable flow regimes if necessary.

2. Pursue funding for northern pike, largemouth bass, and salmonid studies to develop a better understanding of existing and potential fisheries resources in the lower Flathead River and its tributaries.

3. Pursue the mitigation of fish habitat lost due to the operation of Kerr Dam should studies indicate that losses have occurred.

4. Kerr Dam should operate in such a fashion as to insure successful reproduction of important game fish species while at the same time recognition should be given to the economic importance of hydropower to the Confederated Salish and Kootenai Tribes.

Wildlife-Lower Flathead River

Impacts on Wildlife

Wildlife may be impacted by energy developments such as Kerr Dam in many ways. Water level fluctuations, removal of stream bank vegetation, and powerlines are examples. Species of special concern are mule and white-tailed deer; fur bearers, mainly beaver; bald eagles; osprey; red-tailed hawks; waterfowl, particularly Canada geese; and upland game birds, especially pheasants; and non-game animals.

Water level fluctuations affect wildlife species both directly and indirectly. Canada geese may have their nests flooded or nesting islands exposed depending on the operation of Kerr Dam. Riparian and emergent vegetation may be either enhanced or eliminated depending on the degree of water level fluctuations.

Riparian and emergent plants are critical habitat components for wildlife species such as fur bearers, ducks, geese, and swans. Loss of forage fish habitat due to water level manipulation will influence predatory bird populations. Water fluctuations may also affect raptors by changing fish vulnerability. Additional impacts on other species are poorly documented.

The trees along the Flathead River provide an important structural component to the vegetation. Construction of even low-head hydropower sites will necessitate the removal of all trees. This loss will affect wildlife species several miles from the river. For example, Canada geese and osprey nest in old-growth trees; bald eagles perch in them throughout the winter. White-tailed and mule deer use these forested areas for winter range. Loss of the forested bends will affect white-tailed deer over a large area beyond the river's edge.

Wildlife Goal

To protect, perpetuate, enhance, and manage resident and certain introduced species at population levels consistent with their role in the ecosystem.

Wildlife Objectives

To manage wildlife species such as big game, upland game birds, fur bearers, and non-game species at population levels that are consistent with recreational needs, tribal needs and habitat capacity.

To perpetuate and enhance waterfowl numbers and habitat.

To protect and enhance raptor species, particularly nesting osprey as well as nesting and wintering bald eagles.

To manage predator species at a level consistent with their role in the ecosystem and compatible with surrounding communities.

To work with concerned agencies to improve wildlife management.

Wildlife Recommendations

1. Establish criteria for wildlife population levels and habitat requirements to meet tribal and recreational needs, including subsistence hunting. Initiate and complete studies to accomplish this task.

2. Reduce water level fluctuations during the nesting period for Canada geese and other waterfowl and/or build suitable nesting structures.

3. Initiate a study of the bald eagle population and their habitat selection during winter in order to properly manage this endangered species.

4. Initiate a study of the diurnal habitat use and movements of white-tailed and mule deer to determine the importance of cover along the lower Flathead River.

5. The Confederated Salish and Kootenai Tribes shall continue to participate in recovery plan implementations for threatened and endangered species.

6. Determine if changes in water fluctuations would allow the establishment of riparian vegetation along the river.

Recreation-Lower Flathead River

Impacts on Recreation

Water level manipulations resulting from the operation of Kerr Dam can significantly impact recreational activities on the lower Flathead River. Boating is probably the most seriously affected activity although waterfowl hunting and fishing are also impacted. Aesthetic qualities are degraded when mud flats and shorelines are exposed. Extreme water level fluctuations threaten public safety below Kerr Dam.

Recreation Goal

To restore, maintain and enhance, to the greatest extent possible, a diversity of high quality recreational opportunities on the lands and waters impacted by the development and operation of Kerr Dam.

Recreation Objectives

To protect and enhance opportunities for fishing from the shore, by wading and motorized and non-motorized boating at levels necessary to meet public demand along the Flathead River.

To protect and enhance opportunities for waterfowl and upland game bird hunting on those lands and waters on the Flathead Indian Reservation that are impacted by the development and operation of Kerr Dam.

To protect and enhance the opportunities for recreational boating at levels necessary to meet public demand along the river.

To protect and enhance the high quality aesthetic values found on the Flathead Indian Reservation.

To protect recreational visitors from rapidly fluctuating water levels below Kerr Dam.

Recreation Recommendations

1. Harvest data from hunters and fishermen should be obtained to monitor game and fish populations more accurately and formal interviews should be conducted to determine their characteristics and attitudes.

2. Develop methods to obtain baseline information on the timing, amounts, distribution and types of use that may affect fish and wildlife resources.

3. Correlate sensitive wildlife areas (waterfowl and raptor nesting sites) with the timing, distribution and types of recreational use.

4. Determine the recreational needs of tribal members.

5. Conduct an economic analysis of the value of recreational use.

Historical and Cultural Resources-Lower Flathead River

Impacts on Historical and Cultural Resources

As with Flathead Lake, the historical and cultural significance of lower Flathead River should not be overlooked. Dr. Charling I. Malouf of the University of Montana made a cultural resources reconnaissance of the Flathead Indian Reservation in 1960. His reconnaissance identified a large number of prehistoric sites on Flathead Lake and the Flathead River. Dr. Malouf stated that the area around Flathead Lake and along the Flathead River between Polson and Dixon may be the most important center of ancient life in western Montana, and that the entire area is so rich and dense in sites that it could be considered one large archeological site. Sites downstream from Dixon occur less frequently; however, one of the largest sites associated with the Flathead River was identified downstream from Dixon.

The density of sites reported in the vicinity of the Flathead River indicated that there are probably a large number of prehistoric and historic cultural resources present that have not yet been identified. Based on resource evaluations by Dr. Malouf, these sites probably represent a very significant data base for understanding Montana prehistory and the native American population of the region.

Any loss of these historical and cultural sites due to energy development would be a great injustice.

Historical and Cultural Resources Goal

To record and protect all historical sites and identify cultural needs of the Salish and Kootenai people.

Historical and Cultural Resources Objectives

To establish criteria which will insure that all historical and cultural sites are protected in the future.

Identify the Indian people's cultural needs and uses of the lower Flathead River in modern times.

Historical and Cultural Resources Recommendations

1. Interview tribal elders.

2. *Explore the river for historical or cultural sites.*

3. *Record, document, and protect historical and cultural sites.*

4. *Protect the Indian people's needs and uses of Flathead Lake in modern times.*

On-Site and Off-Site Mitigation

To the knowledge of the Confederated Salish and Kootenai Tribes, on-site or off-site mitigation has not taken place on either the Flathead River or the south half of Flathead Lake.

No changes in Kerr Dam's operation to improve the fish and wildlife resource has been noted.

KOOTENAI RIVER

The Confederated Salish and Kootenai Tribes are opposed to any alteration of the Kootenai River because of its special cultural importance to the Kootenai people. Currently cultural and spiritual sites are being identified to enable their protection. The Tribes are also concerned about preservation of the white sturgeon and its habitat.

The following resolution was passed by the Tribal Council of the Confederated Salish and Kootenai Tribes of the Flathead Reservation.

RESOLUTION OPPOSING KOOTENAI FALLS DAM

WHEREAS, the Northern Lights Electric Co-op is proposing to build a dam at Kootenai Falls on the Kootenai River near Libby, Montana, and,

WHEREAS, the site is in the aboriginal hunting and fishing grounds of the Confederated Salish and Kootenai Tribes, and,

WHEREAS, P.L. 95-341 (92 Stat. 469), the American Indian Religious Freedom Act, guarantees Native Americans the inherent right to free exercise of their religion, and,

WHEREAS, it is the site of one of the last Kootenai Vision Quest sites in Northwest Montana and its destruction would infringe upon the Kootenai people's freedom of religion, and,

WHEREAS, there are 15 archeological sites in the area to be inundated 10 of which are prehistoric, now, therefore,

BE IT RESOLVED, by the Tribal Council of the Confederated Salish and Kootenai Tribes that for the above reasons the Tribes are opposed to the construction of Kootenai Falls Dam.

C E R T I F I C A T E

The foregoing Resolution was adopted by the Tribal Council of the Confederated Salish and Kootenai Tribes on the 6th day of July, 1979, with a vote of 9 for 0 opposed and 0 not voting, pursuant to the authority vested in it by Article VI, Section 1 (a), (c) and (u) of the Tribes Constitution and Bylaws; said Constitution adopted and approved under Section 16 of the Act of June 18, 1934 (48 Stat. 984) as amended.

Thomas E. Vatle
Chairman, Tribal Council

ATTEST:

Fred Lamebull
Tribal Secretary

SUMMARY STATEMENT

The Confederated Salish and Kootenai Tribes, with assistance from the Bureau of Indian Affairs' Wildlife Branch and Tribal Recreation and Fisheries Departments, has entered an era of cooperation with the State of Montana and other entities. This step will provide a base on which the Confederated Salish and Kootenai Tribes will be able to protect and enhance the environmental quality of two of the most important resources found on the Flathead Indian Reservation, the lower Flathead River and the south half of Flathead Lake.

The Confederated Salish and Kootenai Tribes are supportive of the goal statements that define the mission of the Northwest Planning Council direction. These goals are as follows:

The mission of the Northwest Planning Council is threefold:

To provide accountable leadership in electricity planning and policy formulation for the Pacific Northwest;

To plan for the management of electricity demand and supply to sustain a healthy and growing economy and a healthy environment at the lowest total cost;

To secure regional consensus on energy development and utilization.

Therefore under the authority of P.L. 96-501 and the appropriate state laws, the Council will pursue the following goals:

--To provide an adequate, reliable and cost effective supply of electricity.

--To protect and enhance environmental quality.

--To secure implementation of all cost effective electricity conservation.

--To stimulate the development and implementation of cost effective renewable and alternative energy resources, both as a source of electricity and as a substitute for electricity.

--To increase the stocks of anadromous fish on the Columbia River and its tributaries, balancing the needs of the region for both fish and power production.

--To review the cost effectiveness of the basic assumptions underlying the planning and operation of the region's electricity supply system.

--To provide public education about regional electric power issues, particularly future rate impacts.

--To facilitate and encourage public participation in resolution of these issues.

--To maintain low rates made possible by the hydropower development in the Pacific Northwest while stimulating investment and consumption decisions as if rates reflected the high costs of new thermal resources.

--To provide a stable planning environment for prompt, conclusive decisions on electric energy issues.

--To prepare a demand forecast with sufficient end use detail so that conservation progress can be monitored and evaluated on a continuing basis.

--To identify and eliminate institutional barriers to the implementation of cost effective conservation and renewable resources.

--To develop a reliable power plan which realistically can be supported by the regional economy and national capital markets.

Many of the Tribes' goals, objectives, and recommendations parallel that of the Montana Department of Fish, Wildlife, and Parks.

CLARK FORK RIVER BASIN

BASIN DESCRIPTION

Geography

The Clark Fork rises in the Silver Bow (or Highland) Mountains south of Butte, Montana and flows northwestward approximately 350 river miles to Lake Pend Oreille in northern Idaho. The portion of the Clark Fork Basin in Montana encompasses an area of 22,000 square miles. The basin is mountainous with the Mission, Swan, Bitterroot, and Cabinet mountain ranges lying wholly or partly within its boundaries. A few peaks exceed elevations of 10,000 feet above sea level. The drainage is covered with large forested tracts, the continuity of which is broken by grazing and cropland areas which are situated in valleys at lower elevations.

Over 150 tributaries drain into the Clark Fork in Montana. The largest include the Flathead, Bitterroot and Blackfoot rivers which enter the Clark Fork River 106, 212 and 226 river miles upstream from Lake Pend Oreille, respectively. These three rivers account for half of the drainage area in the Clark Fork River system (Table 5).

The five largest cities in the drainage are Butte, Missoula, Anaconda, Kalispell and Deer Lodge. The Clark Fork Basin has been widely known for its mining and smelting industries. The copper mines at Butte and smelters at Anaconda (which recently shut down) are internationally famous. An aluminum reduction plant is located in the town of Columbia Falls near Glacier National Park. Logging, lumbering and paper manufacturing are industries supported by forests of the basin. The tourist trade is a large contributor to the economy. The basin is nationally known for its scenic beauty, fishing, hunting and other recreational features. Agriculture is an important industry in the basin.

A total of eight hydropower dams are located on the Clark Fork drainage in Montana. Flint Creek Dam is located at the outlet of Georgetown Lake, 38 miles upstream from the mouth of Flint Creek. Milltown Dam is located on the main stem of the Clark Fork, 225 miles upstream from Lake Pend Oreille (just upstream from Missoula). Three main stem dams exist on the lower Clark Fork River; Thompson Falls, Noxon Rapids and Cabinet Gorge, 70, 31, and 11 miles upstream from Lake Pend Oreille, respectively. Three projects are located on the Flathead River system (see Flathead River Basin)(Figure 3).

Hydrology

The Clark Fork-Pend Oreille River system is one of the major tributaries of the Columbia River as it contributes over 13 percent of the annual runoff of the Columbia River at The Dalles, Oregon. The Clark Fork Basin in Montana supplies 10 percent of the runoff to the Columbia River

Table 5. Drainage area and discharge for the period of record at U.S. Geological Survey gauging stations on the Clark Fork River system.

Station	Drainage Area (mi^2)	Discharge (cfs)		
		Mean	Maximum	Minimum
Flint Creek	208	99	1,680	15
Clark Fork at Drummond	2,378	709	8,490	58
Rock Creek	885	595	5,520	45
Blackfoot River	2,290	1,653	19,200	200
Bitterroot River	1,049	933	11,500	71
Clark Fork below Missoula	9,003	5,496	52,800	388
Flathead River near Polson	7,096	11,740	82,800	5
Clark Fork below Cabinet Gorge Dam	22,073	22,380	153,000	762

Figure 3. Map of Clark Fork drainage.

measured at The Dalles. Average annual stream flow of the Clark Fork near the Montana-Idaho line is 22,380 cfs. The drainage area is 22,073 square miles (Table 5).

One of the 150 tributaries to the Clark Fork, the Flathead River, supplies over 50 percent of the average annual flow. The next two largest tributaries, the Blackfoot and Bitterroot rivers supply seven and four percent of the average annual discharge, respectively (Table 5). The average gradient of the main stem Clark Fork in Montana is 10 feet per mile.

Mean annual precipitation in the basin ranges from 11 to 20 inches. Temperatures can be extreme; -30° F to 100° F ranges have been recorded in some sub-basins. The average growing season ranges from 39 to 137 days (U.S. Department of Interior, Bureau of Reclamation 1959).

The bulk of the stream flow in the Clark Fork system is stored as snow. May and June produce nearly 50 percent of the annual runoff. About 70 percent of the annual runoff occurs during the four-month period, April through July.

The four main stem dams on the Clark Fork River contain little storage capacity and have little influence on seasonal discharge patterns. Two major storage projects on the Flathead River system, Kerr and Hungry Horse dams, do have potential to noticeably alter magnitudes of flow seasonally in the Clark Fork.

Recreation Use

Excluding the Flathead River system (see Flathead River Basin), three tributaries to the Clark Fork are classified as Class I streams (highest fishery resource value; see Appendix C for definition). These include Rock Creek, Blackfoot River and Fish Creek.

Rock Creek is one of the most highly valued and popular trout streams in Montana. The sub-basin is nationally renowned and supports heavy angling pressure during the summer season. Because angling pressure has been so high, special restrictive regulations have been in force in recent years (Workman 1981).

The Blackfoot River drainage is extensively used for fishing, floating, and camping. Many Missoula County residents use the Blackfoot for recreation, accounting for 60 percent of the total use. Over 80 percent of those who use the river fish (Walker 1977). A recreation corridor was established on the river in 1975 whereby local government and landowners cooperate in managing the river for recreation. The Blackfoot River is the most heavily floated river in westcentral Montana.

Fish Creek is a small tributary with high quality trout habitat which drains directly into the main stem Clark Fork about 20 miles downstream from Missoula. The stream supports self-sustaining resident populations

of rainbow and cutthroat trout and migratory runs of rainbow and bull trout from the Clark Fork River. The stream is heavily used by regional fishermen.

A significant fishery also exists in the 2,768 acre Georgetown Lake on Flint Creek. Georgetown Lake receives extremely heavy angling pressure both during summer and winter. Fishermen catch rates are among the highest in the state (Workman, D.L. 1981, personal communication).

Other important tributaries of the Clark Fork which support a trout fishery but may be somewhat less productive because of altered habitat, poor stream flow, or other factors include the Bitterroot, St. Regis and Thompson rivers. These streams are all rated as Class II (high priority fishery resource value).

The main stem of the Clark Fork throughout most of its length is rated as a Class II stream because of its fishery resource value. The river provides significant recreational opportunities which consist primarily of fishing and boating or rafting. Historically, the Clark Fork has had water quality problems from heavy metal pollution (from mine tailings in the upper drainage), industrial pollution and domestic sewage. Pollution abatement has occurred through much of the drainage resulting in the return of a significant trout fishery in the upper one-half of the drainage where fish could not previously survive.

Fish and Wildlife Resources

Rainbow and brown trout probably rank as the most abundant and sought after trout species in the Clark Fork drainage. Cutthroat and brook trout are locally abundant in tributary streams. Mountain whitefish are abundant throughout the drainage and provide a winter fishery. Migratory bull trout are found throughout the drainage in small numbers. Kokanee salmon and rainbow trout provide a large portion of the fishery in Georgetown Lake. Lake whitefish are common in the lower two main stem reservoirs. Warm water species such as yellow perch and largemouth bass are found locally throughout the drainage. Northern pike are found in the lower three reservoirs. A list of fish species and their distribution is given in Table 6.

For a description of wildlife species present see description of Flathead River Basin.

Table 6. Distribution of fish species in the Clark Fork drainage of Montana excluding the Flathead River system (Huston 1981a; Workman 1981).

Common name	Scientific Name	
Westslope cutthroat trout	*Salmo clarki lewisi*	Tributaries and reservoirs
Rainbow trout	*Salmo gairdneri*	Throughout drainage
Brown trout	*Salmo trutta*	Throughout drainage
Bull trout	*Salvelinus confluentus*	Scattered throughout drainage
Brook trout	*Salvelinus fontinalis*	Tributaries
Kokanee	*Oncorhynchus nerka*	Georgetown Lake
Mountain whitefish	*Prosopium williamsoni*	Throughout drainage
Lake whitefish	*Coregonus clupeaformis*	Noxon Rapids, Cabinet Gorge
Arctic grayling	*Thymallus arcticus*	Heart Lake, Fuse Lake
Northern pike	*Esox lucius*	Lower drainage
Yellow perch	*Perca flavescens*	Throughout drainage
Largemouth bass	*Micropterus salmoides*	Throughout drainage
Black bullhead	*Ictalurus melas*	Lower drainage
Pumpkinseed	*Lepomis gibbosus*	Throughout drainage
Northern squawfish	*Ptychocheilus oregonensis*	Throughout drainage
Peamouth	*Mylocheilus caurinus*	Throughout drainage
Redside shiner	*Richardsonius balteatus*	Throughout drainage
Longnose dace	*Rhinichthys cataractae*	Throughout drainage
Longnose sucker	*Catostomus catostomus*	Throughout drainage
Coarsescale sucker	*Catostomus macrocheilus*	Throughout drainage
Slimy sculpin	*Cottus cognatus*	Throughout drainage
Mottled sculpin	*Cottus bairdi*	Throughout drainage
Burbot	*Lota lota*	Planted in Noxon Rapids Reservoir in 1971

FLINT CREEK PROJECT

Project Description

Flint Creek is a high-head project located on Flint Creek 38.8 miles upstream from its confluence with the Clark Fork River. It was originally built by the Anaconda Copper Mining Company in 1905 and utilizes Georgetown Lake as its forebay. Georgetown is a shallow lake with a surface area of 2,768 acres and a useable storage of 31,000 acre-feet. The Flint Creek hydroelectric plant has two generators with a total installed capacity of 1,100 kilowatts, through a gross head of 718 feet (U.S. Department of Interior, Bureau of Reclamation 1959). The Montana Power Company bought the plant facilities from the Anaconda Company in 1912.

Project Operations

The Flint Creek Project has the potential to draw Georgetown Lake down 10 to 15 feet; however, because the lake is so large compared to the drainage area, drawdown is usually limited to three feet to allow refilling of the lake. Drafting of the lake usually occurs during winter to provide energy, provide storage room for spring runoff, and to limit ice damage. A flow of 30 cfs must be released at the request of downstream users for the purpose of irrigation during May 1 to October 1. Anaconda Company has the ability to divert water into or out of Georgetown Lake (Montana Power Company 1981).

History of Fish and Wildlife Resources

Numerous fish species have been planted over the years, but the species which comprise the bulk of the fishery at present include self-sustaining populations of kokanee salmon and brook trout. A healthy population of rainbow trout is maintained through annual hatchery planting. Georgetown Lake is very productive and supports one of the most intensive lake fisheries in Montana (Workman 1981).

The Flint Creek Dam impounded a hay meadow with only a small amount of riparian habitat being lost. Wildlife affected by this habitat loss would have been primarily nongame species, with minor effects on furbearers. Waterfowl populations probably benefited from impoundment.

Impacts on Fish and Wildlife

The drawdown of three feet on Georgetown Lake for the operation of Flint Creek hydroelectric project has, by itself, not adversely impacted the fisheries in the lake. Georgetown Lake is a shallow, productive lake with extensive growths of submerged vegetation. Winter fish kills have occurred during periods of ice and snow cover which prevented light from reaching plants. As a result, respiration by plants and animals and decomposition of organic matter depleted available oxygen in the

in the water while photosynthesis was not recharging oxygen levels. Fish kills resulted from low oxygen levels. Drawdown during winter accentuates the problem by decreasing the volume of water which can store oxygen. Generally, during years when winter drawdown was limited to three feet, winter fish kills were not a problem.

Flint Creek Project has generally used three feet of storage during its winter operation. In past years, Anaconda Company, which owns water rights in Georgetown Lake, has diverted water from the lake during winter and resulted in total winter drawdowns in excess of three feet. It was during these years that winter fish kills were a problem. In recent years, the Anaconda Company has not withdrawn water during the winter and fish kills have not occurred. Presently, the Anaconda Company is trying to sell its water rights in the Flint Creek drainage.

Mitigation of Project Impacts

Mitigation for fisheries has not been attempted on the Flint Creek Project as past operations have not warranted such action.

Mitigation for loss of wildlife resources has not been attempted.

Management Goals and Objectives

The fish management goal for the Flint Creek Project is to maintain and improve the significant fishery in Georgetown Lake. Specific objectives include: 1) providing maximum numbers of rainbow trout 12 to 14 inches in length; and 2) providing optimum numbers of kokanee of an acceptable length range.

The wildlife management goal is to protect, maintain, and enhance the available supply of all species of wildlife and their habitat in the project area in order to meet the demand for all types of wildlife-oriented recreational pursuits.

Recommendations to Protect, Mitigate and Enhance Fish and Wildlife Resources

1. To maintain habitat conditions suitable for the survival of salmonids in Georgetown Lake, future operations of the Flint Creek Project should not be altered from past practices without considering and incorporating the needs of the fishery in those plans (1.2.3).

MILLTOWN PROJECT

Project Description

Milltown Dam is located on the Clark Fork River seven miles upstream from Missoula, Montana, and 225 miles upstream from Lake Pend Oreille. It was originally constructed in 1906-07 with four, 600 kilowatt generating units. A fifth unit of 640 kilowatt capacity was added in 1926 making the total plant capacity of 3,040 kilowatts. This is a low head, run-of-the-river development with the powerhouse forming a section of the dam. The spillway portion of the dam is a 216-foot long rockfill timber crib structure. A sluice section and a gravity wall section complete the dam which creates a small reservoir backing water both up the Clark Fork and Blackfoot rivers. The reservoir is heavily silted, and its reduced storage capacity is approximately 300 acre-feet. Maximum depth of the reservoir is approximately 30 feet. The project was licensed by the Federal Power Commission in 1965 and is effective until 1993 (Federal Energy Regulatory Commission 1980).

Project Operations

The Milltown Dam is a run-of-the-river project. Excessive water during periods of high flow are passed over the spillway or through the sluiceway. To increase the head, eight-foot high, wooden flashboards are raised on the crest of the dam. Prior to spring runoff, the flashboards are lowered to accommodate high flows over the spillway. After recession of high flows (usually in July), the water surface elevation in the reservoir is lowered to the crest of the dam whereupon the flashboards are again raised. The hydraulic capacity of the plant is 2,000 cfs while mean daily discharge of the Clark Fork upstream from Missoula is 3,020 cfs (Pickett 1981, U.S. Geological Survey 1980).

Because Milltown Dam is old and constructed of wood, maintenance is often needed. To make necessary inspections and repairs, it is periodically (once every few years) necessary to draft the reservoir up to 22 feet. Large mud flats are exposed during this drawdown which occurs at the onset of spring runoff and large quantities of silt and organic matter are discharged.

History of Fish and Wildlife Resources

Gamefish native to the Clark Fork drainage include cutthroat trout, bull trout, and mountain whitefish. Prior to construction of main stem dams on the Clark Fork in the early 1900's, bull trout had large spawning migrations up the Clark Fork which extended to the Missoula and probably Butte areas. The Salish Indians congregated in the Missoula area each year and took advantage of the seasonal concentrations of bull trout (Malouf 1975). Westslope cutthroat trout are migratory throughout their range including the Flathead River system (Graham et al. 1980c). Historically, these spawning migrations also occurred in the upper Clark Fork

drainage.

Gold was discovered in the upper drainage in 1864 and since that date mining has been an important industry. In 1902, a copper smelter was built in Anaconda. Drainage through mine tailings introduced heavy metals into the Clark Fork River and became such a serious problem that by the early 1950's, the main stem was devoid of fish life from Rock Creek upstream (Columbia River Basin Interagency Committee 1957). Pollution abatement programs were initiated in the early 1970's and resulted in such a dramatic improvement in water quality that a significant brown and rainbow trout fishery soon developed (Workman 1981). Presently, these two trout species, along with mountain whitefish, are the most important game species in the upper Clark Fork River.

Impacts on Fish and Wildlife

Milltown Dam, built in 1906, was the first impoundment on the main stem of the Clark Fork River. Upstream migrations of fish were totally blocked by this structure. Migratory bull and cutthroat trout were the species most likely impacted. Lake Pend Oreille, 225 miles downstream, may have been the source of a large number of the migratory fish, similar to the current situation in Flathead Lake-River system.

The small reservoir behind Milltown Dam is almost entirely filled by sediment. During the deep drawdown for inspection (22 feet) and to a much lesser degree during the annual operational drawdown (8 feet), organic matter and sediment is discharged into the Clark Fork downstream from the dam. Fish populations downstream from Milltown Dam appear to be depressed compared to other areas in the main stem of the Clark Fork (Peters 1981). Marcoux (1970) attributed a high mortality of trout held in cages downstream from the dam to either extensive discharges of sediment released during the deep drawdown or to high levels of heavy metals associated with the sediment.

The flooded area once served as winter range for white-tailed deer, and was probably utilized by ruffed grouse as well as furbearers and nongame species. Negative affects would have been as previously described for these species.

Contrary to the effects on other species, the Milltown Dam has created some prime waterfowl habitat and water level fluctuations are not so large as to eliminate emergent vegetation. Waterfowl nesting could be enhanced through the provision of secure nesting sites, either floating or elevated platforms or the construction of islands. Canada geese have been transplanted here in the past and attempts are being made to establish a resident breeding population.

Mitigation of Project Impacts

No attempt has been made to mitigate for the blockage of migratory runs of fish in the Clark Fork River. Dams constructed downstream from Milltown are now blocking runs of migratory fish which originate in

Lake Pend Oreille.

Operational procedures at Milltown Dam have not, historically, included constraints for the benefit of fish and wildlife. Perhaps the major reason is that fish populations were depressed by other upstream water quality problems for a long period of time. Since pollution abatement has occurred in the drainage upstream from the project, the impacts from the operation of Milltown Dam have become more important.

Mitigation for wildlife losses has not been attempted.

Management Goals and Objectives

The fish management goal is to increase fishing opportunity in the Missoula area. The fish management objective related to the Milltown Project is to improve water quality and habitat conditions in the Clark Fork River below the dam for the purpose of increasing populations of brown and rainbow trout to within the potential expected for a river this size.

Recommendations to Protect, Mitigate and Enhance Fish and Wildlife Resources

Montana Power Company is presently developing a long range plan to determine future operations, maintenance and rehabilitation of Milltown Dam in light of present and future economic conditions and environmental impacts. Recommendations on whether the project should be upgraded, maintained, or abandoned will be developed during 1982. Operational procedures to minimize environmental impacts will also be included in the plan.

1. *Upon completion of the preliminary problem identification stage of the long-range planning process in 1982 (1.2.4):*

   a) *An evaluation by the Montana Department of Fish, Wildlife and Parks should be made to determine if the recommended measures adequately protect the fishery resource downstream from the project.*

   b) *A study, if needed, should be conducted to evaluate the adequacy of the recommended measures on the fishery resource below the dam. This study would measure suspended sediments, heavy metals, fish abundance and growth, and macroinvertebrate populations.*

THOMPSON FALLS, NOXON RAPIDS AND CABINET GORGE PROJECTS

Project Descriptions

Thompson Falls, Noxon Rapids and Cabinet Gorge are three run-of-the-river projects. The projects are located on the lower 70 miles of the Clark Fork River upstream from Lake Pend Oreille. Thompson Falls Dam, the upstream most project, was constructed in 1916. Cabinet Gorge Dam, 11 miles upstream from Lake Pend Oreille, is in Idaho just across the Idaho-Montana border and was constructed in 1952. Noxon Rapids Dam is located between the other two projects 31 miles upstream from Lake Pend Oreille, and was constructed in 1959.

Thompson Falls Dam is located on the Clark Fork River (a navigable waterway) near the town of Thompson Falls in Sanders County, Montana. The dam is situated 69 miles upstream from Lake Pend Oreille. The project consists of a 1,016 foot long and 54 foot high (maximum) concrete gravity main dam; a 449 foot long and 45 foot high concrete gravity auxilary dam located across two "islands" between the powerhouse and the main dam; a 450 foot long and 80 foot wide power canal cut through rock; a powerhouse containing six 5,000 kilowatt generating units; six 6.67 foot diameter steel penstocks and a 12 mile long reservoir with a useable storage capacity of 15,000 acre-feet. Construction on this power generation project began in 1913 with the first and sixth generating unit coming on line in 1913 and 1917, respectively. Montana Power Company acquired the Thompson Falls project from Thompson Falls Power Company in 1929 and has been operating it continuously since that time as part of its integrated electric system. The project is located 125 miles downstream from Kerr Dam and 165 miles downstream from Milltown Dam.

Noxon Rapids Dam is located 38 miles downstream from Thompson Falls Dam and is also in Sanders County, Montana. The project is owned and operated by Washington Water Power Company. The dam is 4,910 feet long and 180 feet high and consists of three segments. The central segment is a concrete gravity section with a grated spillway and power intake, and the two abutting segments are earth embankments. The five-generating-unit powerhouse has a total nameplate capacity of 397 MW. The 38 mile long reservoir has a total and active storage capacity of 495,000 and 230,000 acre-feet, respectively. The storage capacity is classified as seasonal. Maximum depth of the reservoir at full pool is 158 feet. The surface area of the reservoir at maximum and minimum pool elevations are 7,920 and 4,950 acres, respectively. The five intakes are 72 feet below maximum pool elevation. The hydraulic capacity of the plant is 50,000 cfs while the average annual stream flow is 21,470 cfs (Woodworth 1981, Federal Energy Regulatory Commission 1980).

Cabinet Gorge Dam is located 20 miles downstream from Noxon Rapids Dam and is also owned by Washington Water Power Company. The concrete arch dam, with gravity abutment sections, is 375 feet long and 140 feet high. Eight vertical lift spillway gates increase the height of the

project an additional 68 feet. The powerhouse, located about 300 feet downstream, contains four turbine-generator units, each of 50 MW capacity. The 3,200 (full pool) acre reservoir extends upstream to the Noxon Rapids Project. Maximum depth at full pool is 125 feet. Total storage capacity of the project is 104,500 acre-feet, while active storage is 42,700 acre-feet. The hydraulic capacity of the plant is 34,300 cfs, while average annual stream flow is 22,380 cfs (Federal Energy Regulatory Commission 1980, Woodworth 1981).

Project Operation

Thompson Falls

The Thompson Falls project has been operated to serve base loads, and generation at this run-of-the-river plant depends upon the natural river flow. The 15,000 acre-feet of storage at the site would not normally be utilized since the large drawdown of the reservoir would decrease the effective head available and therefore reduce the capacity of the plant. Currently, reservoir level and spill are controlled by adding and removing flashboards at the main and dry channel dams. Flashboards are removed prior to spring runoff and are not replaced until normal summer flow. Because of this, up to 13 feet of head are lost for two to three months each year. The average annual flow of the Clark Fork near Plains, Montana, is 20,100 cfs, while the present hydraulic capacity of the plant is 11,100 cfs (Federal Energy Regulatory Commission 1979, Columbia River Water Management Group 1981).

Montana Power Company obtained permission to modify the taintor gate system in its new license issued December 28, 1979. The company proposed to install two remotely operated taintor gates and replace the top eight feet of the existing flashboard systems on both dams with timber drop panels and convert the existing flashboards stanchions to a tripable type. These modifications would allow Montana Power Company to hold the reservoir at its normal full level during a greater portion of the year than is presently possible and, as a result, to increase power production by an estimated 32 million kilowatt hours annually (Federal Energy Regulatory Commission 1979).

Montana Power Company is also considering the addition of one generating unit housed in a single new powerhouse. The size range of the new unit would be 50 MW, while the existing plant is rated at 40 MW. The nominal hydraulic capacity of the new plant will be 12,000 cfs. Two operational alternatives are being considered for the potential powerhouse additions. One plan involves continued operation as a run-of-the-river plant with only inadvertent fluctuations in reservoir water levels similar to present conditions. The second plan is to convert to peaking or load shaping operations. This would involve using a portion of the storage in the reservoir to supplement the normal river flow on a scheduled basis (Sullivan 1980).

Noxon Rapids

The "seasonal" storage of Noxon Rapids Reservoir allows the project to operate as a peaking plant within the confines of river flows. The reservoir and power station are operated on a weekly cycle throughout most of the year. That is, water is released from storage during daytime hours on weekdays to meet heavy load requirements and is replaced during "graveyard" hours on weekdays and throughout the weekends when load requirements are lighter. Maximum allowable daily drafting is two feet and weekly drawdown is 10 feet. Average operations are one foot daily and three feet weekly. The project's seasonal drawdown of 36 feet is planned to begin in late winter and to continue until the spring runoff begins, normally in late April. The seasonal drawdown is generally one-half of the respective allowable maximums. However, drafting of the reservoir is usually not done unless required by the Pacific Northwest Coordination Agreement (Woodworth 1981).

Cabinet Gorge

Cabinet Gorge, a run-of-the-river project with limited storage capacity, operates as a satellite plant of the Noxon Rapids project. As a result, daily and weekly fluctuations are generally the result of upstream operations and are about two and three feet, respectively. Maximum possible drawdown is 15 feet (Woodworth 1981). Operation of Cabinet Gorge prior to construction of Noxon Rapids Dam (1952-1960) resulted in daily and weekly water level fluctuations of three and 14 feet, respectively (Huston 1965).

Washington Water Power Company provides a voluntary minimum flow of 3,000 cfs through the Cabinet Gorge project (Woodworth 1981).

History of Fish and Wildlife Resources

Historically, the Clark Fork River was a major corridor and spawning ground for fish migrating out of Lake Pend Oreille, Idaho, a fishery of national renown. Important species include the westslope cutthroat trout, bull trout, lake whitefish and kokanee. All of these species had spawning migrations into the Clark Fork drainage (U.S. Fish and Wildlife Service 1966, Vanek 1972).

Residents who fished the lower Clark Fork drainage in Montana prior to construction of Cabinet Gorge Dam indicated that fishing on the main stem was generally unproductive except at concentration areas during periods when fish migrated out of Lake Pend Oreille. The mainstem fishery of particular importance was the snag fishery for kokanee at Thompson Falls and Heron Rapids, 68 and 15 miles upstream from Lake Pend Oreille, respectively. Mature bull and cutthroat trout were readily caught in many of the tributary streams and in the main stem near the mouths of these tributaries (Montana Department of Fish, Wildlife and Parks 1981). The fall kokanee migration probably lasted six to eight weeks (Graham et al. 1980, McMullin and Graham 1981, Vanek 1972). The cutthroat

migration probably lasted from March to June while bull trout probably began their migration during spring runoff and did not complete spawning until fall (Graham et al. 1980c). Lake whitefish were also captured migrating up the Clark Fork during autumn (Vanek 1972). One resident species that probably provided a significant autumn fishery was the mountain whitefish (Gaffney 1956, Malouf 1975).

The species complex in Lake Pend Oreille in 1952 was very similar to that presently in Flathead Lake. The bulk of the fishery in the Flathead River system upstream from Flathead Lake is dependent upon mature cutthroat trout, bull trout, and kokanee salmon migrations out of Flathead Lake and into tributaries during spawning runs or upon immature trout which temporarily rear in tributary streams prior to emigrating to Flathead Lake. Although the "resident" fishery in the Flathead River system may be limited, protracted migrations of cutthroat trout, bull trout, and kokanee at various times of the year simulate a "resident" fishery of significant proportions (Graham et al. 1980c).

Indian historians also referred to the significance of trout migrations in the Clark Fork River. Salish Indians used weirs to catch migrating fish in side streams of the lower Clark Fork such as Graves Creek, Deep Creek, Beaver Creek and others (Malouf 1975). Fish made up as much as 30 percent of the Salish diet with bull and cutthroat trout the most favored (Malouf 1979). The Salish also fished for migratory bull trout near Missoula. In fact, the Salish name for the Missoula, Milltown and Butte area refers to "bull trout" which were caught there (Malouf 1974). Malouf (1974) made the reference that the construction of Thompson Falls Dam blocked the ascent of bull trout up the Clark Fork River. Missoula is 211 river miles upstream from Lake Pend Oreille.

Bull trout in the Flathead River spawn in the upper reaches of the system and return the same year to Flathead Lake often traveling 140 or more miles one way (the maximum length of the Flathead River above Flathead Lake). The bull trout population in the Flathead drainage is almost entirely adfluvial; living in a lake as subadults or adults and migrating into tributaries to spawn (Graham et al. 1980c). The similarity and geographic proximity of the Flathead and Clark Fork River systems would suggest that bull trout were mostly adfluvial in the Clark Fork River system with fish rearing as subadults and adults in Lake Pend Oreille and reproducing in the Clark Fork River system where juvenile fish would rear two to four years before migrating downstream.

Impacts on Fish and Wildlife

Fisheries

The three dams on the lower Clark Fork River blocked access to spawning grounds for fish migrating out of Lake Pend Oreille. The Montana fishery for migratory westslope cutthroat trout, kokanee and bull trout was eliminated by construction of Cabinet Gorge Dam. These migratory

fish populations supported a major proportion of the fishery in western Montana.

Thompson Falls Dam was built in 1916 and is a barrier to upstream fish migration from this point upstream (to Milltown Dam). Important tributaries in this reach include; Thompson River, Flathead River, St. Regis River and Bitterroot River. The closure of Cabinet Gorge Dam (11 miles upstream from Lake Pend Oreille) in 1952 totally blocked migrations of fish from Lake Pend Oreille into Montana. Spawning streams for migratory trout in this reach include; Bull River, Prospect Creek, Vermillion River, Graves Creek, Pilgram Creek, Swamp Creek, Elk Creek, Martin Creek, Rock Creek, and Trout Creek (Montana Department of Fish, Wildlife and Parks 1981; Huston 1981a).

Cabinet Gorge Dam eliminated an intensive snag fishery for kokanee in the Clark Fork River by eliminating access to spawning grounds in the Clark Fork River upstream in Montana. Large concentrations of kokanee were evident at Heron Rapids and Thompson Falls where popular snag fisheries had developed (Montana Department of Fish, wildlife and Parks 1981, Vanek 1972). The magnitude of this run can be demonstrated by the fact that an estimated 100,000 kokanee were observed (not an absolute estimate) downstream from Cabinet Gorge Dam soon after closure. Within three years of closure, this run to Cabinet Gorge Dam was only 10 percent of previous years (Jeppson 1953; 1954 and 1960).

Noxon Rapids Reservoir, built in 1959, inundated 36.5 of the remaining 38 miles of free-flowing river between Cabinet Gorge and Thompson Falls Dams. Because Cabinet Gorge Dam was already in place 19 miles downstream, the closure of Noxon Rapids Dam did not impact the migratory fishery from Lake Pend Oreille.

Over 70 miles of river habitat has been impounded by main stem dams on the lower Clark Fork; 34 percent of the river from Missoula downstream and 21 percent of the entire Clark Fork River in Montana. This represents a significant loss of free-flowing habitat.

Fish passage facilities were not installed on any of the Clark Fork dams. Height (208 feet) of Cabinet Gorge Dam, the downstream-most structure, precluded installation of a fish ladder in 1952. Current technology still does not make success (including downstream migration of juvenile fish) of such a structure a preferred option for mitigation.

The lower three Clark Fork reservoirs have been in operation from 22 to 65 years, yet during this expanse of time significant populations of gamefish have not become established. This is true in spite of thousands of man hours and hundreds of thousands of dollars expended in an attempt to establish an acceptable fishery. Management schemes have included a massive rehabilitation and restocking program (Gaffney 1959b; Huston 1967 and 1977).

Localized and seasonal fisheries for whitefish, largemouth bass, and brown trout presently exist in some of these reservoirs. It is difficult to document the overall on-site impact of the reservoirs on the fishery because of the lack of good baseline data. For that reason, the Montana Department of Fish, Wildlife and Parks wrote to a number of fishermen in the area of the Clark Fork reservoirs in the summer of 1981 requesting information on the quality of the fishery prior to and after construction of dams on the river. A large majority responded that the present fishery was poor and lightly fished, and that it had deteriorated from pre-dam conditions.

Wildlife

The habitat types and associated wildlife species affected by these three dams are almost identical. Therefore, to avoid unnecessary repetition, the following discussion will for the most part deal with the three projects collectively.

The three lower Clark Fork projects collectively inundated nearly 21 square miles of land, much of it riparian habitat, along approximately 70 miles of river bottom. This was a major impact on local wildlife habitat and wildlife populations dependent upon them. This impact was almost entirely negative, especially since vacant replacement habitat in the vicinity probably did not exist and the only new habitat created was aquatic. Impacts would be species-specific and the magnitude would depend on the relative population size, distribution, and degree to which those animals required the habitats lost to or created by inundation to complete their life cycle.

These projects pre-date the period when trained wildlife biologists were stationed in the local area; therefore, little documentation regarding the impacts of these projects on wildlife exists. The U.S. Fish and Wildlife Service (1966) quotes an earlier (1950) letter report to the Federal Power Commission which stated that the Cabinet Gorge Project would have little effect on wildlife, and later that the project had had no known significant effect on wildlife resources. These conclusions appeared to be drawn with a minimum amount of documentation. Wildlife losses from the other lower Clark Fork projects seem to have been similarly dismissed.

A letter regarding fisheries values related to the proposed Noxon Rapids Project (Stefanich 1953b) states that some excellent deer areas would be flooded, but to what extent was not known at this time. A later letter (O'Claire 1955) stated that during normal winter conditions, an approximate 10 percent reduction in big game winter range would occur. The significance of this reduction of winter range would be intensified during severe winters. Possible increases in the incidence of train-deer collisions were also addressed, with adjustments such as right-of-way fencing proposed if the problem became serious (O'Claire 1955).

Since little preimpoundment information exists, the magitude of probable impacts on various species would be of a speculative nature, although the direction (whether positive or negative) of the impact is fairly predictable. Therefore, the species impacted and the probable direction of these impacts will be listed with no attempt to quantify actual affects.

The majority of impacts for terrestrial species would have been negative, primarily due to a net loss of habitat. Big game affected would have been principally white-tailed deer, with mule deer, elk and black bear of secondary concern. Effects on other big game species were either minor or of no consequence. For several years after Noxon Dam was completed, deer and elk were lost through thin ice while attempting to cross from one side to the other.

Beaver, muskrat, mink and otter were the principal furbearers affected, with the overall impact being detrimental.

The ruffed grouse was the only upland bird species significantly impacted. Since they depend on vegetation types which include deciduous trees, especially of the genera *Betula* and *Populus* (Johnsgard 1973), and these genera are most prevalent in the riparian vegetation type, habitat losses in this type would impact ruffed grouse negatively.

A wide variety of nongame species were undoubtedly negatively impacted by the flooding of this much habitat. This included small mammals and avian species dependent upon the inundated lands to complete all or part of their life cycle.

Bald eagles winter as far north as open water and food are available, including most of the major rivers of the Columbia River drainage (U.S. Army Corps of Engineers 1979). Impacts of these projects on wintering bald eagles may have been either positive or negative, depending on whether ice-free areas and/or food availability have increased or declined following impoundment.

Waterfowl were affected both negatively and postively, depending on species involved. Negative impacts for all species included loss of old oxbows and backwater slough areas, and post-impoundment water level fluctuations which may either flood nests or expose island nests to mammalian predators when land bridges form at low water levels. These have been offset by creation of additional island nest sites and some goose brood rearing areas when water levels drop in summer.

These reservoirs have provided many species of migrant waterfowl with previously absent staging and/or resting areas. Suitable wintering areas may have changed, depending on availability of food and ice-free areas before and after impoundment.

The net effect of these projects on waterfowl is difficult to determine due to the lack of adequate pre-project baseline data. The projects have probably been beneficial for geese and the potential exists to improve the benefits for ducks if recommendations are adopted.

Mitigation of Project Impacts

Mitigation for impacts on the fishery resource from construction of Cabeint Gorge and Noxon Rapids projects included payment by Washington Water Power Company of $100,000 and $78,000, respectively, to the Montana Department of Fish and Game (Montana Fish and Game Commission 1953, 1958). Washington Water Power Company has continued to provide money and manpower for fish management activities in attempts to establish an acceptable fishery in Cabinet Gorge and Noxon Rapids reservoirs. Little mitigation has been attempted for the loss of fishery resources due to construction of Thompson Falls Dam in 1916.

Management activities in Cabinet Gorge and Noxon Rapids reservoirs and tributaries have attempted to establish a cold water fishery. Management schemes included a massive rehabilitation (poisoning of Thompson Falls Reservoir and the Clark Fork River prior to closure of Noxon Rapids Dam) and restocking program. Species of fish stocked in Cabinet Gorge and/or Noxon reservoirs include: rainbow trout, brown trout, westslope cutthroat trout, yellowstone cutthroat trout, kokanee, coho salmon and burbot (Table 7). Fish were planted as eggs, fry, juveniles and catchables, both in the reservoirs and in tributaries. Tributaries were stocked in an attempt to imprint fish to return to these streams to spawn. Some form of stocking has been ongoing since 1953 (Gaffney 1956, Gaffney 1959, Huston 1967-1980).

Mitigation for loss of wildlife resources has not been attempted.

Thompson Falls Reservoir

Management activities in Thompson Falls Reservoir included the poisoning of rough fish populations in 1958 in an attempt to insure the success of rainbow trout plants in the downstream Noxon Rapids Reservoir (Gaffney 1959b). Approximately 2,000 catchable rainbow trout were planted in Thompson Falls Reservoir in 1965 and one million young kokanee were stocked during the years 1971-1974 (Table 7). Gamefish which have entered the reservoir from upstream areas include largemouth bass, yellow perch, and brown trout. Gamefish populations and fisherman use of this reservoir are apparently minimal (Gaffney 1956; Montana Power Company 1973; Huston 1981a).

Noxon Rapids Reservoir

The Washington Water Power Company funded the Montana Fish and Game Commission to conduct a pre-construction inventory of the project area's fishery resources. Survey results indicated the free-flowing

Table 7. Fish planting records for Thompson Falls, Noxon Rapids and Cabinet Gorge reservoirs and tributaries.

Location	Year(s)	Species	Size	Number
Thompson Falls Reservoir	1965	Rainbow	6-8"	2,000
Thompson Falls Reservoir	1971-1974	Kokanee	fry	250,000 per year
Noxon Rapids Reservoir	1958-1967	Rainbow	2-8"	3,329,467 total
Noxon Rapids Reservoir	1971	Burbot	10-20"	425
Noxon Rapids Reservoir	1971-1972	Rainbow	10"	1,500 per year
Noxon Rapids Reservoir	1972	Kokanee	Fry	400,000
Noxon Rapids Reservoir	1977-1979	Cutthroat (Westslope)	2"	529,863 total
Noxon Rapids Reservoir	1981	Rainbow	5"	160,000
Prospect, Graves, Tuscor and Marten creeks	1961-1962	Rainbow	Eggs	891,000 total
Tuscor and Dry creeks	1962-1963	Brown	Eggs	33,000 total
Prospect Creek Incubation Channel	1966-1969	Brown	Eggs	2,392,000 total
Prospect Creek Incubation Channel	1967-1968	Cutthroat	Eggs	740,000 total
Trout, Swamp, Graves, Prospect Clear creeks	1977-1979	Cutthroat (westslope)	1"	408,171 total
Cabinet Gorge Reservoir	1953-1956	Kokanee	Fry	1,202,816 total
Cabinet Gorge Reservoir	1953-1956	Cutthroat (Yellowstone)	Fry	1,183,952 total
Cabinet Gorge Reservoir	1954	Coho Salmon	Fry	100,224
Cabinet Gorge Reservoir	1959-1961	Rainbow	4-7"	483,174 total
Cabinet Gorge Reservoir	1966-1980	Rainbow	Legals	approx. 2,500 per year

stretch of the Clark Fork River (the Noxon Project area) harbored mountain whitefish as the most abundant game species (Gaffney 1956). Rough fish species (e.g. squawfish, suckers) were found to be dominant in the system by a ratio of nine to one. The study recognized a need for control of rough fish if the impoundment were to provide a productive sport fishery.

An investigation by the Montana Department of Fish and Game into the feasibility of using poisons to remove fish from the project area was completed in 1958. As a result of the study recommendations, the toxicant "rotenone" was used to implement river rehabilitation. The Department considered the kill effective at reducing rough fish populations (Gaffney 1959b). A concurrent kill in the upstream area of the Thompson Falls Reservoir was conducted to slow the reintroduction of rough fish into the project area.

With the reservoir devoid of competing fish, massive stocking of trout was initiated. Two and one-half million fingerling rainbow were released between 1958 and 1960. An additional one million rainbow and brown trout eggs had been planted in the new reservoir's tributary streams by 1962 (Table 7). The cost of this rehabilitation was shared by Washington Water Power Company and the Department.

Sport fishing for rainbow trout was good during years immediately after rehabilitation, however, by 1961 trout populations and angler success steadily declined. Possible reasons for the change in trout populations included a build up of rough fish populations and a change in operation of the Noxon Rapids Project. In 1961, this project was integrated with other northwest hydroelectric projects and resulted in a 30 to 40 foot annual spring drawdown compared to previous drawdowns not in excess of 10 feet (Huston 1965). Subsequent investigations were conducted jointly by the Department and Washington Water Power Company biologists from 1963 through 1965. The study results indicated rainbow trout tended to migrate downstream, out of the reservoir, when spill discharge exceeded 40,000 cubic feet per second (Huston and Vaughn 1968)..

From 1965 through 1970, management emphasis shifted to brown trout. This species was believed to be less susceptible to migration during high spring flows. The Washington Water Power Company leased lands near the mouth of Prospect Creek for the construction of incubation channels. Brown trout eggs and fry were planted in the improved stream in substantial numbers. However, the survival and reproduction of this species to sustain a productive sport fishery has never been apparent. The fact that few adult brown trout were captured by fishermen or observed in tributary streams in subsequent years suggest survival is limited or emigration is significant (Huston 1972a).

Also in 1971, a release of 425 burbot was made into the reservoir. This species was considered by the Department to be suitable for "run-of-the-river" impoundment habitat because; 1) burbot are not dependent

on an extensive tributary system for reproduction; and 2) they would likely compete with and/or utilize the ever increasing rough fish populations. The introduction of burbot was apparently unsuccessful possibly due to too few fish in the one-time release.

The most recent attempt to establish a productive trout fishery in the Noxon Reservoir began in 1977. Over a period of three years, approximately 1.2 million westslope cutthroat trout fingerlings and fry were released in the Noxon Reservoir and four tributary streams.

The success of this effort is as yet inconclusive; however, annual surveys have not confirmed the presence of these stocked cutthroat trout in any great numbers. Limited manpower precluded tributary surveys in the spring of 1981, the first year adults of these fish would be expected to spawn.

In 1981, the Department released 175,000 rainbow trout into Noxon Reservoir. Drought conditions in eastern Montana preempted release of the four to five inch fingerlings into other Montana waters. These fish are expected to contribute to the impoundment's sport fishery primarily during fall 1981 until spring runoff flows in 1982.

Gamefish comprised approximately one percent of the fish captured in gill nets in Noxon Rapids Reservoir in 1980. Northern pike, although never stocked, were first collected in Noxon Rapids Reservoir in 1972 (Huston 1973b). This species is still uncommon in the reservoir. Yellow perch have been present for an even greater period of time and, although it is relatively common, the small size of most fish discourage its use. Largemouth bass are also present in the reservoir but are not abundant. The fact that these species have been present for an extended period of time yet have not developed a fishery indicates that factors exist which limit the establishment of a warm water fishery.

The Department has been maintaining an annual, general survey of the reservoir area since 1955. These surveys have often been conducted with assistance from Company biologists. Much of the information has been reported by the Department in annual Job Progress Reports (Huston 1967-1980).

Cabinet Gorge Reservoir

From 1952 (the year Cabinet Gorge Reservoir was closed) to 1955, nearly one million yellowstone cutthroat and one million kokanee fry were planted in Cabinet Gorge Reservoir (Table 7). Despite these introductions these species made up less than one percent of fish taken in gill nets in 1955 (Gaffney 1956). From 1952 to 1961, 1,200,000 kokanee, 100,000 coho salmon, and 2,400,000 cutthroat fry were planted in Cabinet Gorge Reservoir. During this time period, 483,000 rainbow trout were planted which were four to seven inches long.

During 1966 to 1980, 37,500 "legal" size rainbow trout were planted in Bull River Bay of Cabinet Gorge Reservoir (Table 7). In addition, from 1958 to 1981, numerous introductions of various species were made in Noxon Rapids Reservoir, many of which ended up in Cabinet Gorge Reservoir (Huston and Vaughn 1968). To date, the bulk of the cold water gamefish population in Cabinet Gorge Reservoir is made up of mountain and lake whitefish and brown trout. Gamefish comprised approximately five percent of the gill net catch in June of 1980 (Huston 1980).

Northern pike, although in the drainage for at least the last 10 years, are rare in the reservoir. Yellow perch are common but their small size discourages fishermen use. Largemouth bass are locally common and support an unquantified fishery.

Brown trout, whitefish, and largemouth bass are species difficult to catch or require special fishing techniques. Because these species comprise the bulk of the gamefish population in Cabinet Gorge Reservoir, the problem of providing an acceptable fishery is compounded.

Poor Productivity

Perhaps the main reason a quality fishery has not developed on the Clark Fork reservoirs is that all are basically "run-of-the-river" impoundments. At the mean rate of inflow, water exchange occurs approximately once every 11.6 days in Noxon Rapids, 2.4 days in Cabinet Gorge and every nine hours in Thompson Falls reservoirs. These rates are influenced by rates of inflow and reservoir storage capacity. Plankton densities are low (Huston 1977) probably because nutrient levels never build up in the reservoirs and water current washes plankton downstream. Brook and Woodward (1956) noted that retention time in small lakes must exceed 18 days to get zooplankton development. Johnson (1964) observed that zooplankton crops declined at an accelerated pace if the flushing time was less than 15 days.

Fluctuating water levels and much of the reservoir topography also prevent the establishment of a littoral zone. The littoral zone is the portion of a body of water extending from the shoreline lakeward to the limit of rooted plants. Great diversity for plant and animal species and high annual production characterize the littoral zone (Cole 1975; Reid 1961). Thus, the two major food producing areas normally found in a lake, the littoral and limnetic (open surface water areas which produce plankton) zones are severely restricted by present habitat conditions in the lower Clark Fork reservoirs.

The flowing water in the reservoir resembles river habitat; however, environmental conditions in the reservoirs restrict production of benthos normally found in rivers. Benthic populations are extremely low because riffle habitats are flooded and reservoir water levels fluctuate (Huston 1977).

Without good numbers of zooplanktors and/or benthic organisms, a necessary link in the food chain for fish is weakened. The vast majority of salmonids planted in these reservoirs did not survive, or moved downstream through these slow moving impoundments.

Unsuitable Water Temperature

Maximum water temperatures in these impoundments (surface temperatures up to 74° F with little thermal stratification) may limit salmonid production. Warm water species such as yellow perch, northern pike, and largemouth bass are only locally common and populations are dominated by small individuals, probably indicative of poor productivity and relatively cool (for these species) water temperatures.

Water Level Fluctuations

Thompson Falls Dam is a run-of-the-river structure, but because of design features, drawdown during spring has been as great as 16 feet (Montana Power Company 1973). Cabinet Gorge Reservoir fluctuated three feet daily and 14 feet weekly prior to construction of Noxon Reservoir 20 miles upstream. From 1961 to present, operations of Noxon Dam has reduced daily and weekly fluctuations in Cabinet Gorge to three and five feet, respectively. Since 1961, water levels have fluctuated less in Cabinet Gorge Reservoir than in Thompson Falls or Noxon (Huston 1965). Cabinet Gorge also has the best gamefish population of the three reservoirs (Huston 1980, 1981b). Noxon Reservoir is used for peaking power and had a maximum spring drawdown of 40 to 60 feet during 1961 to 1970 (Huston 1965) while since that time, maximum drawdown has been 36 feet (Woodworth 1981).

Water level fluctuations in the lower three Clark Fork Reservoirs may be detrimental to fish populations which spawn along shorelines. Near maximum winter drawdown in Noxon Reservoir can block spawning fish from ascending Marten Creek and Vermillion River during spring (Woodworth 1981). Inadequate flows in the south channel downstream from Thompson Falls Dam may prevent fish from ascending Prospect Creek (Huston 1981a). Fluctuating water levels reduce densities of benthic organisms (Huston 1977, 1981b) and prevent establishment of a littoral zone (at least in localized areas of the reservoirs) which can be a productive food producing area.

Squawfish, peamouth, largescale suckers, longnose suckers and small yellow perch dominate the fish population in the lower three Clark Fork reservoirs. From 1955 to 1962, after extensive rehabilitation and fish stocking, gamefish comprised 25 percent of the fish populations in Noxon and Cabinet Gorge Reservoirs. Of 2,200 and 1,100 fish netted in Noxon Reservoir in 1976 and 1979, less than two and five percent, respectively, were gamefish (Huston 1981b). The slow moving river-like reservoirs have created habitats in which undesirable species have established relatively large populations compared to gamefish populations. These

undesirable species are much more numerous than gamefish and discourage fisherman use by taking bait intended for gamefish.

Water Quality

All three lower Clark Fork River reservoirs add to gas saturation levels. This is especially likely to occur during the spring high water period when water has been spilled. On May 13, 1974, gas saturation levels at the reservoir surface ranged from 102 percent at Thompson Falls forebay to 136 percent at Cabinet Gorge forebay (Huston 1975b).

Severe gas supersaturation can cause direct mortality of fish. Thorn et al. (1978) observed that trout (lake, brook, rainbow and brown) mortality began when saturation levels generally reached 120 to 125 percent. One hundred percent mortality occurred when saturations were 130 and 144 percent depending on the species. Cause of death was attributed to massive air emboli in major blood vessels and the heart. Sublethal effects included lowered growth rate, decreased resistance to diseases, and eye damage.

Because of the effect of pressure on the solubility of gas in water, supersaturated conditions at the reservoir surface are not the same at greater depths. For example, 130 percent gas supersaturation at the water surface will be at equilibrium at a depth of 10 feet (Leman 1971). Fish and aquatic life inhabiting the upper water levels of Noxon Rapids and Cabinet Gorge reservoirs, particularly during the high water period would have to descend to deeper water to survive.

Heavy metal and other pollution problems in the upper drainage may also be impacting the aquatic ecosystem in the lower drainage.

Management Goals and Objectives

Fisheries

Fish management goals for the Thompson Falls, Noxon Rapids and Cabinet Gorge projects on the lower Clark Fork River include:

1. Establish an acceptable, self-sustaining recreational fishery in the lower Clark Fork reservoirs as partial mitigation for fishery losses due to construction of the aforementioned dams.

2. Enhance or protect stream fisheries in the Clark Fork drainage necessary to maintain fishing opportunity in and around the Clark Fork reservoirs as partial mitigation for fishery losses due to construction of the dams.

3. Enhance or protect other valuable or potentially valuable fisheries in the Clark Fork drainage as mitigation for losses of migratory fishes to the upper basin due to impoundment of the Clark Fork River.

Wildlife

To protect, maintain and enhance the available supply of wildlife and their habitats in the vicinity of these projects in order to meet the demand for wildlife-oriented recreational pursuits as mitigation for project-related wildlife losses.

Recommendations to Protect, Mitigate and Enhance Fish and Wildlife Resources

Fisheries

On-site

1. To establish a significant fishery in the lower Clark Fork River reservoirs, management activities must increase fish survival, reproductive success, and production. It is recommended that a study be initiated to: 1) assess the existing habitat suitability for species now present and those designated for possible introductions (this would include assessment of spawning, rearing, food, and cover habitats and hydrological, limnological, and water quality conditions); and 2) determine the most feasible methods to improve habitat suitability or increase habitat availability for desirable species considering particular species needs, project operations, costs and other constraints (1.7.1).

The poor gamefish production in the lower Clark Fork reservoirs is typical of other run-of-the-river reservoirs in Montana. Fish management measures to date have not produced a satisfactory fishery. For this reason, it is necessary to review past fish management practices, reservoir operations as it affects fish habitat, and life history and habitat requirements of game species stocked in the past and those considered for future introductions. Limnological conditions and fish populations in Thompson Falls, Noxon Rapids and Cabinet Gorge reservoirs must be quantified and compared to habitat conditions and project operations of each reservoir to determine the reason for poor fish production and develop ways to improve it. The requirements of fish species stocked in the past and those considered as future introductions should be correlated to rearing habitat, food production, water quality parameters, and project operations in each of the three reservoirs. If significant deficiencies exist in water quality or habitat in any of the three reservoirs, remedies should be found before further stocking takes place.

Specific study objectives include:

1. Determine if food production is adequate to allow survival and growth of gamefish in the lower Clark Fork reservoirs and investigate ways to improve it (if necessary). Methods to increase food production may include stabilizing water levels along the shoreline to encourage establishment of a littoral zone, providing artificial substrate to increase insect production, or other techniques.

2. Identify areas and determine water levels necessary to provide rearing and spawning habitat for selected game species. A survey to compare shoreline topography, water level flux, and potential littoral development in these reservoirs is appropriate.

3. Determine the potential of Marten Creek and Vermillion River as spawning streams and (if appropriate) provide access to spring spawning fish by maintaining water levels in Noxon Rapids Reservoir, constructing an access channel, or other methods.

To accomplish the fish management goals for the lower Clark Fork reservoirs, habitat conditions must be provided so selected fish species can survive, grow and reproduce to provide a suitable self-sustaining fishery. A self-sustaining recreational fishery is more desirable than long-term hatchery plants because: 1) the natural offspring are from parents which have adapted to present habitat conditions; and 2) the long-term costs of raising and planting fish in sufficient numbers can be prohibitive.

The four species of fish which dominate the gamefish population in the lower Clark Fork reservoirs include lake whitefish, mountain whitefish, brown trout and largemouth bass. Although the size of these populations is unquantified, each appears to be self-sustaining.

Lake whitefish and largemouth bass reproduce in reservoirs and lakes. Once spawning areas on the Clark Fork reservoirs are located, the habitat can be assessed to determine the effect of project operations and other variables on reproductive success. The information will allow inadequacies in spawning habitat to be determined and corrected prior to management of designated species.

Long-term dewatering of spawning areas can reduce reproductive success of fish by exposing fish eggs or making spawning areas unavailable to gravid fish. Water levels must be stable or increasing during spawning period of gamefish and not decline to expose fish embryos for long periods of time during the incubation period. By identifying critical reproductive periods and existing or potential spawning areas, suitable water levels can be determined and implemented as practicable. Investigations will be necessary to determine the best method to maintain water levels at spawning grounds. Water levels can be maintained by changing project operations or by other methods such as constructing dikes around spawning areas.

Declining or low water levels in Noxon Rapids Reservoir can inhibit access to spawning grounds in Marten Creek and Vermillion River. Since Noxon Rapids Reservoir reaches complete drawdown in late winter, the greatest blockage is for spring spawning fish. The potential of these two tributaries as spawning grounds for spring spawning fish should be determined and measures to provide access implemented if findings warrant.

It should be determined if these passage problems were a result of operation of Noxon Rapids Dam or were historical problems. This would be necessary to determine if proposed mitigation measures would be classified as on-site enhancement measures or mitigation for operation.

4. Determine the importance of the tailwater below Thompson Falls Reservoir for spawning and rearing of lake and mountain whitefish, brown trout and other fish, and quantify and maintain necessary flows and spawning habitat.

Little is known concerning the importance of the 1.5 miles of river habitat below Thompson Falls Dam. This is the only remaining river habitat in the lower 80 miles of the Clark Fork River in Montana and may have potential as a spawning area for lake and mountain whitefish, brown trout and other salmonids. Potential problems which must be addressed include scouring of suitable-sized gravel and maintenance of favorable spawning flows.

Flows in the south channel below Thompson Falls Dam may be inadequate to attract fish upstream to Prospect Creek, a potentially important spawning tributary. Proposed additions to Thompson Falls generation facilities could compound this problem by diverting a larger portion of the river, for a longer period of time, through the powerhouse (which returns to the north channel downstream from the mouth of Prospect Creek). Adequate attractant and passage flows should be determined and operational recommendations made to the Council and appropriate agencies.

The tailwater fishery below Thompson Falls Dam is one of the most successful of the lower Clark Fork reservoirs and may be important rearing habitat for salmonids. Necessary instream flows should be determined and operational recommendations made to the Council and appropriate agencies.

5. Delineate important spawning tributaries and determine and implement (if appropriate) measures to increase reproductive success of reservoir gamefish in the lower Clark Fork drainage.

Fish which reside in the Clark Fork reservoirs and reproduce in tributary streams include brown, cutthroat, bull and rainbow trout as well as mountain whitefish. Spawning locations and possible improvements for passage and reproduction should be determined. Potential factors which may limit reproductive success may include adequate flows for passage and spawning, suitable spawning substrate, proper channel and hydraulic characteristics, adequate streambank cover, and adequate water quality. Enhancement of tributaries to improve spawning success could help offset lack of reproduction in the reservoirs. The feasibility of implementing enhancement measures, at areas where reproductive success could be improved, should be determined and appropriate actions taken.

6. Determine if water quality in the lower Clark Fork reservoirs is adequate for survival, growth and reproduction of desirable fish species.

The effect of pollution in the upper Clark Fork River on the survival, growth and reproduction of fish and fish-food organisms in the lower Clark Fork reservoirs in unknown. Water temperature (surface maximum 74° F) and total gas supersaturation (surface maximum 136 percent) may also be limiting survival and growth of certain species. Analysis of water quality should be done on the lower Clark Fork reservoirs to determine if this factor is limiting gamefish production. Water quality parameters should be correlated to requirements of specific fish species to determine if water quality has prevented or will prevent establishment of selected game species.

Off-site

The impacts of hydroelectric projects often reach far beyond the immediate dam and reservoir location. This is particularly true with migratory fish species such as the westslope cutthroat trout, bull trout and kokanee salmon. As mentioned in preceding sections of this document, a fishery based on these species has been progressively reduced by the closures of three of the four mainstem Clark Fork dams in Montana (Noxon Rapids excluded). In this perspective, the following off-site enhancement and protection measures should be viewed as project mitigation for losses which were not previously mitigated.

1. Compensation for loss of a significant river fishery in the lower Clark Fork drainage should include enhancement of the Bitterroot River fisheries by purchasing rights to 15,000 acre-feet of water out of Painted Rocks Reservoir from existing willing sellers for the purpose of providing instream flows during the summer and fall (1.8.2).

The lower Clark Fork River reservoirs have blocked a significant migration of fish out of Lake Pend Oreille and eliminated the fishery in Montana dependent on these migrations. The reservoirs have also inundated 80 continuous miles of river habitat. To compensate for loss of a stream fishery, which is becoming less abundant and more valuable throughout the country, protective and enhancement measures for remaining stream habitat in the Clark Fork drainage would be viewed as a form of partial mitigation for these losses.

Agriculture is one of the primary industries in the valley and the Bitterroot River is the lifeblood of that industry. The irrigation season runs from June through September with the heaviest irrigation demands on the river coming in July, August and early September. During this time of year, it is common for the river to be nearly dry except for the deep pools on about 12 miles of the river from Corvallis to Bell Crossing. A number of large diversions are able to take all except the intragravel flow.

Irrigation returns begin to recharge the river about two miles below Bell Crossing. At the Stevensville bridge, about six miles downstream from Bell Crossing, most of the remaining irrigation water returns to the river. The dewatering not only affects fish and other aquatic organisms, but it also adversely affects irrigation efficiency on the mid-section of the river.

To alleviate these problems, Painted Rocks Dam was built in 1938 by the former Montana State Water Conservation Board using funds from the Public Works Administration. The reservoir has a maximum capacity of 32,362 acre-feet. There is normally enough stream flow each spring to fill the reservoir five times.

Water sales from the reservoir are made by means of contracts with the Department of Natural Resources and Conservation. A contract for 5,000 acre-feet is held in perpetuity by the Ravalli Fish and Wildlife Association, Western Montana Fish and Game Association and the Department of Fish, Wildlife and Parks. Approximately 1,500 acre-feet are sold each year to the Dailey Ditches. Sales from the nearly 26,000 acre-feet of the remaining water are seldom made. In 1980, the Department of Natural Resources and Conservation established an operational policy for Painted Rocks Reservoir. This policy makes water available for local use on a short-term basis. It also makes sales on a long-term basis possible, but long-term sales are made only after public review (Montana Department of Natural Resources and Conservation 1980).

Contracts for water make provisions for amounts of water, delivery points and timing of delivery. Where instream flows are concerned, contractual arrangements alone have not insured delivery of water where it has been needed most. This water is normally taken into the irrigation ditches. There is seldom enough water to satisfy both irrigation and instream needs and there is no water commissioner on the river to oversee ditch operation.

Additional water is needed for instream use to alleviate the severe dewatering problem. We estimate that 15,000 acre-feet of water is required to provide sufficient flow for fish during the six weeks of peak irrigation withdrawal. Water rights are presently available from willing sellers, but no money is available to secure them. A water commissioner may also be needed to insure proper ditch operation and delivery of the instream flows through the dewatered area.

2. Compensation for loss of a significant migratory fishery in the Clark Fork drainage should include protection and maintenance of the Big Blackfoot River, Rock Creek and Fish Creek, and possibly other Class I streams in a natural and unaltered condition (1.9.2).

These three streams are Class I streams as determined by a complex and standard Montana stream classification system (see Appendix C). They have the highest stream fishery resource value in that area because

they are heavily fished and contain high quality trout habitat. These resources cannot be replaced, nor could loss of these resources be adequately mitigated.

Protection of these remaining resources could be viewed as a form of partial mitigation for loss of fishery resources in the Clark Fork River resulting from the construction of existing hydroelectric projects.

Wildlife

The following recommendations are concerned with present project operations. Any proposed or possible future changes in operation of these projects would have to be addressed at that time, and possibly new recommendations developed.

On-site

Waterfowl nesting success, especially for geese, could be enhanced in several ways. For example, maintaining water level at or near full pool during the peak season (early March through early to mid-April) would be beneficial. However, such stability may be difficult to achieve because of uncontrollable spring runoff flows. Alternative enhancement measures could include providing artificial nesting structures (either elevated or floating), building up present islands that are normally flooded at high pool so that they are above this level, and/or constructing new island nesting sites.

Because these projects are all basically "run-of-the-river", maintaining stable water levels during the peak of goose nesting might be difficult since it also corresponds with normal spring runoff.

Wood duck nest boxes could provide nesting habitat, assuming other habitat values are suitable for their existence. This should be determined prior to erecting any nesting structures.

Any islands raised or newly constructed should be protected in some manner (rip-rap, log booms, etc.) to prevent erosion and prolong their life.

Selected options involving construction should also be scheduled for regular maintenance and repairs.

Several measures could be used to increase on-site wildlife habitat and/or use of the area. Food and cover plantings could be made using a plant species suited to the growing conditions and the wildlife species involved. Goose brood rearing areas (especially if these are limiting production) could be established and located as near as practicable to nesting concentrations. Ditching (Mathiak 1953) and/or pothole

blasting (Mathiak 1965) in marshy areas having dense cover but little open water would increase the depth and amount of open water. This can benefit many species of waterfowl, furbearers and other forms of wildlife.

The creation of permanent shallow water ponds by constructing dikes that would retain water during drawdowns or that would trap water from springs or small streams entering the reservoirs would benefit waterfowl and other forms of wildlife as well. Islands could be built within ponds at the time of dike construction. Stabilization of water levels and permanence of water in these ponds would probably allow establishment of emergence and submerged aquatic vegetation as well as willows, cottonwoods, etc. along the shorelines. This would benefit a wide variety of wildlife, especially aquatic furbearers and nongame birds.

Off-site

Opportunities for on-site improvement of wildlife values on existing projects are limited to project waters and generally narrow land boundaries. As an alternative to on-site activities and/or to further improve the wildlife values in the project vicinity, off-site enhancement of a designated species, or groups of species, as compensation for previously unmitigated wildlife losses may be necessary.

See off-site recommendations for Hungry Horse progect.

KOOTENAI RIVER BASIN

BASIN DESCRIPTION

Geography

The Kootenai River flows in a southwesterly loop from the west slope of the continental divide near Banff, British Columbia through northwestern Montana, northern Idaho and back into British Columbia (Figure 4). Several interesting geologic features are found in the basin. The Kootenay (Canadian spelling) flows through the Rocky Mountain Trench where the river passes within 1.5 miles of Columbia Lake, source of the Columbia River. Kootenai Falls, the largest remaining water fall in Montana not impounded by a dam is located between Libby and Troy, Montana (Graham 1979). Near Bonners Ferry, Idaho, the Kootenai enters the Purcell Trench where its gradient is so low that the river level at Bonners Ferry is affected by water levels in Kootenai Lake (approximately 50 miles downstream; Bonde and Bush 1975).

Most of the Kootenai drainage is mountainous. Elevations range from approximately 1,370 feet at the mouth to 11,870 feet in the northeastern portion of the drainage. Approximately 88 percent of the drainage is forest covered.

Libby Dam, located 17 miles upstream of Libby, Montana, impounds 92 miles of the river in Montana and British Columbia. Two proposed dams would be located in Montana. The Libby Reregulating Dam would be located 10 miles downstream of Libby Dam and would impound all of the river between the two dams (U.S. Army Corps of Engineers 1974). Kootenai Falls Dam would be located immediately above Kootenai Falls and would impound 3.5 - 4.5 miles of the Kootenai River. Lake Creek, a tributary of the Kootenai near Troy, Montana, is impounded by a low-head dam near its mouth. It is felt that the present Lake Creek Project has had little impact on the Kootenai River or its fish and wildlife populations (Montana Light and Power Company, 1980).

Hydrology

The Kootenai River drains approximately 19,300 miles^2 of which approximately 4,900 miles^2 is in the United States. It is the second largest tributary of the Columbia River, surpassed only by the Snake River. Mean annual discharge measured at Libby, Montana, between 1911 and 1971 was 12,070 cfs. Historic extreme discharges range from a minimum of 895 cfs to a maximum of 121,000 cfs. Gradient of the river averages 5.3 feet/mile over most of its 485 mile length. Gradient varies, however, from near zero between Bonners Ferry and Kootenay Lake to 29.7 feet/mile in the area of Kootenai Falls.

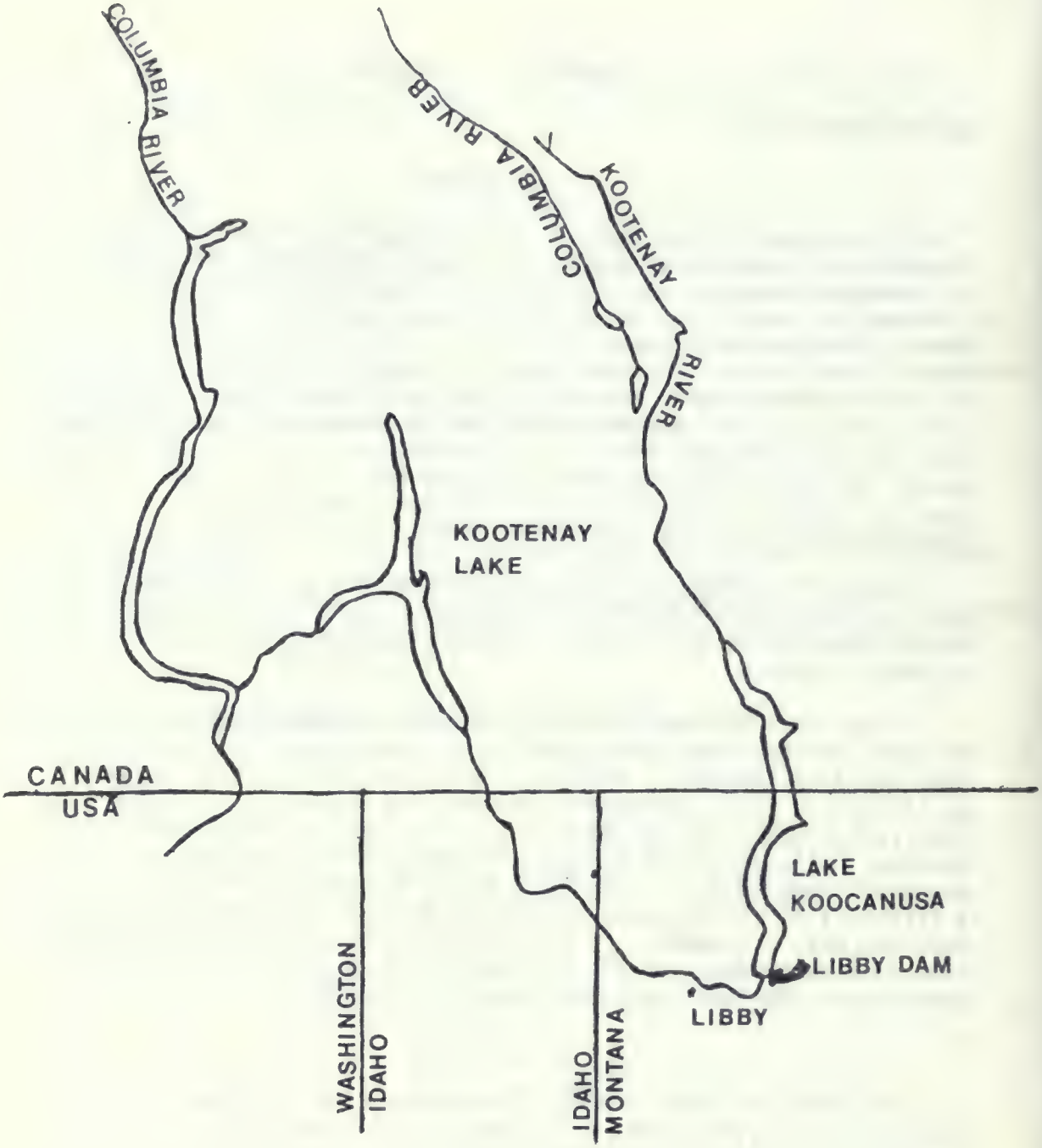

Figure 4. Map of Kootenai River drainage.

Climate of the Kootenai basin is typical of mountainous river basins in the Inland Pacific Northwest. Precipitation averages 30 inches per year. Approximately 70 percent of the total precipitation falls as snow. Mean temperatures range from 67° F in July to 22° F in January at Libby.

Prior to construction of Libby Dam, discharge patterns reflected the basin's climate. Peak flows occurred in May or June with snow melt runoff. Minimum flows generally occurred in mid-winter. Operation of Libby Dam for flood control and hydroelectric energy production drastically altered discharge patterns. Since impoundment, minimum flows downstream of Libby Dam have occurred in April and May when the reservoir was filling. Peak monthly flows occurred from November through January when the reservoir was drafted for flood control (Graham 1979).

Water quality in the Kootenai below Libby Dam has also been altered since impoundment. Supersaturation levels of dissolved gases were common until turbine installation was completed in 1975 (May and Huston 1979). May and Huston (1979) also noted increased algal production due to warmer winter water temperatures, reduced turbidity, and lack of scouring spring flows. Impacts on water temperatures in the river have been diminished by installation of a selective withdrawal system in Libby Dam; however, significant changes have occurred since impoundment. Spring and summer water temperatures are cooler than historic temperatures while fall and winter temperatures are warmer (May and Huston 1979). Ice cover in calm water areas of the river that was common in winter prior to impoundment has not formed since impoundment. The reservoir acts as a nutrient trap, reducing nutrient levels in the Kootenai downstream of Libby Dam (May et al. 1980). Significant reductions in the concentrations of some ions (NH_3, F, PO_4, $CaSO_4$) were not related to impoundment but occurred as a result of a pollution abatement program at a fertilizer plant located on the St. Mary River, British Columbia (Bonde and Bush 1975, Graham 1979, May and Huston 1979).

Lake Koocanusa (the reservoir behind Libby Dam) is a long, narrow reservoir extending upstream to just above Wardner, British Columbia. The reservoir has a storage capacity of 5,809,000 af. Mean depth varies from 125 feet at full pool elevation (2,459 feet) to 60 feet at minimum regulated pool (2,287 feet). Drawdown of the reservoir to minimum regulated pool reduces its volume by 85 percent (May et al. 1979). Operation of Libby Dam usually results in minimum pool elevation in April and maximum pool elevation from July through September.

Lake Koocanusa was expected to exhibit eutrophic behavior due to nutrient loading from the Canadian portion of the Kootenai River (Bonde and Bush 1975). Blooms of *Aphanizomenon flos-aquae*, a blue-green algae characteristic of eutrophic waters, occurred in 1974 and 1975, but a combination of factors has resulted in water quality parameters well within the oligotrophic range. Sediment inflow, weak thermal structure and short retention time (0.67 years) have limited productivity of the reservoir (Woods and Falter 1980).

Operation of Libby Dam could be altered significantly after 1984 if Canadian authorities exercise their right to divert up to 1,500,000 af of water from the Kootenai River to the Columbia River at Canal Flats. The diversion was authorized in a 1964 bilateral treaty. The treaty authorized additional diversion after the years 2024 and 2064. If the diversions are exercised, Canada could divert all water in the Kootenai River above the flows of 2,500 cfs and 1,000 cfs, respectively. If the full potential of the diversions is realized, energy potential of the Kootenai River dams will be limited.

Fishing Use

Graham (1979) estimated 5,705 man-days of fishing pressure were expended in the 3.5 mile stretch immediately above Kootenai Falls in 1978. Expanding Graham's findings to all of the Kootenai River in Montana results in an estimate of approximately 80,000 man-days of fishing pressure. Fishing pressure is probably slightly higher in the Kootenai Falls section than in other sections of the river, but total pressure is probably in the magnitude of 50,000 man-days per year. The Kootenai River fishery easily ranks in the top ten among Montana waters.

No direct creel census of Lake Koocanusa has been attempted. A Montana Department of Fish, Wildlife and Parks mail survey in 1975-1976 estimated 18,568 man-days of fishing pressure on Lake Koocanusa. That figure is probably a low estimate, as evidenced by the estimate of 20,893 man-days for the Kootenai River in the same survey.

Access to Lake Koocanusa was limited in the immediate post-impoundment years but has improved in recent years.

Fish and Wildlife Resources

The Kootenai River is one of the most productive trout streams in Montana (May and Huston 1979). Rainbow trout is the principal gamefish. Anglers also harvest small numbers of westslope cutthroat trout and mountain whitefish (Graham 1979; May and Huston 1979). The entire Montana portion of the Kootenai River is classified as a highest value fishery resource by the State of Montana and the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service 1981). A list of species found in the Kootenai River above and below Kootenai Falls is presented in Table 8.

Two species of special concern are found in the Kootenai River below Kootenai Falls. White sturgeon, classified as rare and endangered by AFS in Montana, are found in limited numbers (Graham 1981b). Populations of native rainbow trout have been found in Callahan Creek and the Yaak River (Allendorf et al. 1978; Espeland and Scow 1978).

Table 8. Relative abundance of fish species in the Kootenai River upstream and downstream of Kootenai Falls (Graham 1979).

Common name	Scientific name	Relative abundance*	
		Upstream	Downstream
Westslope cutthroat trout	*Salmo clarki lewisi*	U	U
Rainbow trout	*Salmo gairdneri*	A	A
Bull trout	*Salvelinus confluentus*	U	U
Brook trout	*Salvelinus fontinalis*	U	U
Mountain whitefish	*Prosopium williamsoni*	A	A
White sturgeon	*Acipenser transmontanus*	N	U
Burbot	*Lota lota*	U	U
Kokanee	*Oncorhynchus nerka*	N	U
Torrent sculpin	*Cottus rhotheus*	U	U
Slimy sculpin	*Cottus cognatus*	R	R
Largescale sucker	*Catostomus macrocheilus*	A	A
Longnose sucker	*Catostomus catostomus*	U	U
Northern squawfish	*Ptychocheilus oregonensis*	R	U
Peamouth	*Mylocheilus caurinus*	R	A
Redisde shiner	*Richardsonius balteatus*	U	R
Longnose dace	*Rhinicthys cataractae*	A	A

*A = abundant, U = uncommon, R = rare, N = not reported.

Rainbow trout and westslope cutthroat trout are the most important gamefish in Lake Koocanusa (McMullin 1979). The spring and fall fishery is rated as good to excellent for trout reservoirs (May et al. 1979). A winter and spring fishery for burbot is gaining popularity (May and Huston 1980). A list of fish species found in Lake Koocanusa and their relative abundance is listed in Table 9.

For description of wildlife species present, see section in Description of Flathead River Basin.

Table 9. Relative abundance of fish species in Lake Koocanusa (May et al. 1979, McMullin 1979).

Common name	Scientific name	Relative abundance*
Westslope cutthroat trout	*Salmo clarki lewisi*	A
Rainbow trout	*Salmo gairdneri*	A
Bull trout	*Salvelinus confluentus*	A
Brook trout	*Salvelinus fontinalis*	R
Lake trout	*Salvelinus namaycush*	R
Mountain whitefish	*Prosopium williamsoni*	A
Burbot	*Lota lota*	U
Kokanee	*Oncorhynchus nerka*	R
White sturgeon	*Acipenser transmontanus*	R
Largemouth bass	*Micropterus salmoides*	R
Pumpkinseed	*Lepomis gibbosus*	R
Largescale sucker	*Catostomus macrocheilus*	A
Longnose sucker	*Catostomus catostomus*	U
Northern squawfish	*Ptychocheilus oregonensis*	A
Peamouth	*Mylocheilus caurinus*	A
Redside shiner	*Richardsonius balteatus*	A

* A = abundant, U = uncommon, R = rare.

LIBBY DAM PROJECT

Project Description

Libby Dam is a main stem, high-head project located on the Kootenai River, approximately 17 miles upstream of Libby, Montana. Construction began in 1966 and was completed in 1973. Reservoir impoundment began in 1972. Full pool was reached in 1974. Powerhouse operations began in 1975.

The concrete gravity dam stands 420 feet above bedrock with a crest length of 2,900 feet. Four generators have a hydraulic capacity of 23,000 cfs and can produce up to 420 MW of electrical energy. Fifteen downstream power plants (five in Canada) benefit from Libby Dam releases. A total of eight turbine bays were built in the powerhouse, but it is uncertain whether all will be utilized. Pending congressional legislation may limit construction to a total of five generators.

The reservoir created by Libby Dam, called Lake Koocanusa, is 90 miles long at full pool. The upper 42 miles are located in British Columbia. The reservoir stores 5,869,000 acre-feet of water. Active storage is 4,979,000 acre-feet. Potential maximum drawdown of 172 feet alters morphometric characteristics of the reservoir significantly. Surface area is reduced from 46,500 acres at full pool to 14,600 acres at minimum pool (at minimum pool the entire reservoir is within the United States). Mean depth is reduced from 125 feet to 60 feet and maximum depth from 351 to 179 feet at full and minimum pool, respectively. Storage ratio of the project is 0.67 years.

Project Operation

Libby is one of four major storage projects in the United States portion of the Columbia basin, along with Hungry Horse, Dvorshak, and Grand Coulee. Flood control operation results in low flows in the Kootenai River during spring and high flows in fall and winter. Both peak and baseload electrical energy are produced subject to several constraints. Minimum flow of the Kootenai River below Libby Dam is maintained at 4,000 cfs whenever possible and 3,000 cfs if reservoir refill is in doubt. In emergency situations, a 2,000 cfs minimum is allowed. Vertical water level fluctuations in the river are restricted to one foot per hour and four feet per day during the summer season (May 1 - September 30). During the winter season (October 1 - April 30), fluctuations of two feet per hour and six feet per day are allowed. Impact on the aquatic environment of an increased rate in reduction in flow from high discharges down to 8,000 cfs is being evaluated and may be adopted as a normal operating procedure. Flows of 4,000 cfs to 8,000 cfs are provided as much as possible on weekends and holidays to enhance fishing opportunity. The selective withdrawal system is operated as described by May et al. (1979).

History of Fish and Wildlife Resources

Little quantitative data is available on the fish population and fishery in the Kootenai River prior to construction of Libby Dam. A revision of a 1965 Fishery Analysis (Huston 1974) characterized the fishery as follows.

The most abundant gamefish species found in Kootenai River in Montana was the mountain whitefish. Westslope cutthroat, rainbow trout and Dolly Varden were common and suckers were abundant. Peamouth and squawfish were rarely found above Kootenai Falls, but were abundant below Kootenai Falls. Burbot were found throughout the river system but were probably most abundant below the Town of Libby, Montana. Sturgeon were found only below Kootenai Falls. Kokanee migrated up the Kootenai River and spawned in several tributaries below Kootenai Falls. Fishes found in mainstem Kootenai River reproduced in the river itself or in tributary streams.

The majority of mountain whitefish spawned in the Kootenai River mainstem. In-river spawning areas that existed within the Libby Dam impoundment area were not known. In-river spawning areas for the Kootenai River downstream to Kootenai Falls, a distance of about 35 miles, appeared to be primarily concentrated within the first 11 miles of the river below Libby damsite. Mountain whitefish utilizing tributary streams for spawning may have moved considerable distances to reach these streams. It was known that some whitefish had moved downstream from near Warland through Libby damsite to spawn in Fisher River. Upstream movement of whitefish from below Libby, Montana to Fisher River had also been documented.

Pre-impoundment surveys revealed a small trout population in the Kootenai River below Rexford, Montana (Huston 1971c, 1972b). Trout fishing below Rainy Creek (near Libby) was extremely poor due to pollution from a mine operation. Burbot fishing was popular and productive in the 1940's and 1950's. Burbot populations declined to near extinction in Montana, however, due to pollution (May and Huston 1979). This decline appeared to coincide with a decline in the white sturgeon population and may be related to water pollution (Graham 1981b).

Impacts on Fish and Wildlife

Fisheries

Libby Dam impounded one-half of the free-flowing Kootenai River in Montana and 42 miles of the river in British Columbia. Storage for flood control modified normal stream flows. Historically, the Kootenai near Libby peaked at an average flow of 67,500 cfs in spring. Minimum flows of approximately 1,600 cfs were reached in fall and winter. Since the dam was built, peak flows of approximately 20,000 cfs have occurred during the fall and winter reservoir drafting period. Low flows of approximately 3,000 cfs have occurred during spring.

Several physical and chemical characteristics of the river have been altered since Libby Dam was constructed. Lack of flushing flows in spring has resulted in build-up of deltas around the mouths of tributary streams. Suspended sediment levels have decreased greatly. Fall and winter water temperatures are warmer and spring and summer temperatures are cooler than they were prior to the dam. Operation of a selective water withdrawal system in Libby Dam has reduced the impacts of Libby Dam on temperatures of the Kootenai River compared to what would be expected of a deep water withdrawal. Changes in suspended sediment, bed scouring flows, and temperature have resulted in greatly increased periphyton growth (May et al. 1980). Prior to operation of the turbines, water released from the spillway or sluices caused gas supersaturation problems in the river. Gas supersaturation levels of over 130 percent were common (May and Huston 1973, 1974, 1975). More recently, water withdrawn from the reservoir has been subsaturated. Nighttime oxygen deficits in the Kootenai River have resulted from the action of heavy periphyton growth on already subsaturated water (May et al. 1981).

Changes in the aquatic biota in the Kootenai River can be attributed to no single factor. Construction of Libby Dam and improvement of water quality occurred during the same time period. Fish populations and the fishery of the Kootenai River were generally improved as a result. Gas supersaturation reduced whitefish populations by over 60 percent between 1973 and 1974 (May and Huston 1975). Whitefish population trend estimates decreased from 468 whitefish/1,000 feet of stream in a river section at Libby in 1973 to 165/1,000 feet in 1974. Elimination of the supersaturation problem resulted in increased whitefish abundance. Whitefish increased to 246/1,000 feet in 1975 and 711/1,000 feet in 1978. A decline in whitefish population to 546/1,000 feet in 1979 and 1980 led May et al. (1980) to believe carrying capacity of the river may have been exceeded before the population stabilized. Preliminary analysis of 1981 trend estimates indicate numbers of whitefish have increased to 770/1,000 feet, but that total biomass is about the same as in 1979 (Bruce May, Montana Department of Fish, Wildlife and Parks, Libby, Montana, personal communication). Growth rates of mountain whitefish have declined in recent years from previous levels (May et al. 1980).

Trout populations in the Kootenai were not as affected by gas supersaturation as whitefish populations. Nevertheless, many trout exhibited signs of gas bubble disease (May and Huston 1975). Rainbow trout trend estimates in the area around Libby increased from 24/1,000 feet in 1973 to 71/1,000 feet in 1974 (May and Huston 1975). Rainbow populations remained stable through 1977, then increased to 116/1,000 feet in 1978. A decline in 1979 was followed by an increase to 114/1,000 feet in 1980, and 202/1,000 feet in 1981 (May et al. 1981). Growth of rainbow trout has slowed as the population has increased. The total population of trout and whitefish may be high enough to cause some competition for food and space (May et al. 1980).

Abundance of westslope cutthroat trout has declined from 20/1,000 feet in 1973 and 25/1,000 feet in 1975 to numbers too low to estimate. The cutthroat population in the river after pre-impoundment and prior to 1975 was almost all from escapement of fish from Lake Koocanusa (May and Huston 1979). When reservoir escapement was reduced, the river population declined.

Construction of Libby Dam probably had negative impact on white sturgeon in the river below Kootenai Falls. Lower spring flows and cooler water temperatures may be responsible for a decline in the number of sturgeon below the falls (Graham 1981b). Good sturgeon populations remain in the Idaho portion of the Kootenai (Partridge 1981).

Despite the increased whitefish population, angling for whitefish has decreased considerably since impoundment. Nearly all of the fish harvested in winter prior to impoundment were whitefish. Whitefish comprised only 10 percent of the winter catch in 1977 and 16 percent in 1978 (May and Huston 1979). Anglers now concentrate on trout which are more abundant than before impoundment and more active at the warmer winter temperatures since impoundment.

Fishing pressure has increased dramatically since 1968. A mail survey estimated 116 man-days per mile of stream was expended in 1968. A similar survey conducted during the 1975-76 season estimated 406 man-days per mile on the 50 miles of river remaining after impoundment. A direct census of the four miles of river directly upstream of Kootenai Falls in 1978 estimated 1,630 man-days of fishing pressure per mile (Graham 1979).

Water quality of the Kootenai River was significantly improved during the period of construction of Libby Dam, but some improvements were not dam related. Effluents from a pulp mill and a fertilizer plant in Canada and a mine operation near Libby seriously degraded water quality. High levels of organic and metal pollutants depressed insect populations (Bonde and Bush 1975). Significant improvements in treatment of effluents were made during and after the period of dam construction. Because water quality was improved at about the same time the dam was built, it is difficult to determine whether subsequent effects on insects and fish populations are attributable to improved water quality or dam operation.

It is clear that regulation of the river altered the insect fauna from a diverse complex of species to one dominated by a few species. Stoneflies were almost completely eliminated from the Kootenai, while a few species of mayflies flourished (May et al. 1980).

The response of fish populations in Lake Koocanusa has been typical of impoundments. Initial increases in abundance of most species were noted (May and Huston 1977). Reservoir aging invariably results in decreased productivity. Abundance of some fish species has already begun to decline (May et al. 1979) but the reservoir has not yet stabilized (May and Huston 1980).

Abundance of all major gamefish except westslope cutthroat trout appeared to peak in 1978 and subsequently decreased (May and Huston 1980). Cutthroat were stocked in the reservoir and its tributaries until 1976, after which cutthroat abundance decreased. Abundance of cutthroat, rainbow and bull trout has decreased dramatically between 1978 and 1980, but at least some of the decrease may have been related to sampling error (May and Huston 1980). A small population of burbot has been increasing steadily since impoundment.

Most species of nongame fish have also followed predictable patterns since impoundment. Squawfish abundance peaked soon after impoundment and although expected to remain high, has decreased since 1976. Redside shiners have decreased dramatically as have longnose suckers. Abundance of peamouth and coarsescale suckers continues to increase.

Trout fishing in Lake Koocanusa has been good during spring and fall. Surface water temperature in summer is usually warm enough to force trout into deeper water, reducing their availability to anglers. Until recently, boat access to the reservoir in spring was limited by drawdown. Construction of low water boat ramps improved access. A winter burbot fishery in the Rexford area has become popular in the last two years.

Rainbow and cutthroat trout comprise most of the gamefish harvested from the reservoir. The cutthroat fishery was impaired by losses of cutthroat downstream out of the reservoir prior to operation of the powerhouse. Before the powerhouse was in operation, water was spilled through either the spillways or sluice ways and many fish were lost downstream (May et al. 1979). A selective water withdrawal system began operating in 1975. Cooperative studies between the Corps of Engineers and Montana Department of Fish and Game established a rule curve for operation of the selective withdrawal system that minimized downstream fish losses and provided river temperatures enhancing trout growth (May et al. 1979, McMullin 1979).

Wildlife

The Libby Dam project was the first hydroelectric project in the Columbia River drainage within Montana to seriously consider the wildlife resource and mitigation of losses to wildlife. An early report (Blair 1955) suggested that the total loss to waterfowl, upland game birds, and furbearers would be small in relation to the overall resource. Subsequent reports, however, stated that furbearers, principally beaver, muskrat, mink and otter would suffer a serious loss of habitat without any feasible means of mitigation; that a substantial population of native grouse would be displaced (Anonymous 1963); and that waterfowl utilization of the stream area proposed for development is small but significant (U.S. Department of Interior 1961).

The greatest concern for wildlife, however, was for big game. The project flooded approximately 25,700 acres (40 square miles) of wildlife

habitat (U.S. Department of Interior 1965), including over 15,000 acres of critical big game winter range (Blair 1955) used by white-tailed deer, mule deer, elk, bighorn sheep and moose. Railroad relocation eliminated an additional 2,000 acres of critical deer winter range along the Fisher River, Wolf Creek and Fortine Creek (Firebaugh et al. 1975). Channelization and stream bank stabilization (rip-rap) conducted in conjunction with railroad relocation along these streams reduced the length of free-flowing stream by nearly two miles and disrupted another 9.7 miles (U.S. Army Corps of Engineers 1971). This either reduced or eliminated habitat for furbearers, ruffed grouse and a wide variety of nongame animals. Relocation of Highway 37 on the east side of the reservoir and a forest development road on the west side resulted in the loss of over 2,100 additional acres of wildlife habitat (U.S. Army Corps of Engineers 1971). In addition to the direct loss of habitat caused by these activities, other negative impacts have been noted, especially for bighorn sheep. The newly relocated Highway 37 cut through bighorn winter range and road kills and poaching are posing a problem (Ciliberti 1980).

Mitigation of Project Impacts

Fisheries

Fisheries mitigation for Libby Dam has included construction of a cutthroat trout hatchery near Rexford, Montana. Mitigation has been received in the form of minimum stream flows, and constraints on rate of river fluctuation and the removal of barriers in several tributaries to the reservoir and conversion of the fish populations in six reservoir tributaries from resident fish to migratory stocks. A selective withdrawal system was built at the request of the Environmental Protection Agency for water quality reasons.

Wildlife

The Water Resources Development Act of 1974 (Public Law 93-251) authorized expenditure of $2,000,000 for acquisition of up to 12,000 acres of wildlife grazing in mitigation of habitat losses resulting from the overall Libby Project (U.S. Army Corps of Engineers 1974). Prior to exhaustion of the authorized $2,000,000, however, just under 2,500 acres had been purchased. One of the parcels purchased for mitigation of big game lands lost through inundation of Libby Dam is the Kootenai Falls area, and portions of this parcel could be flooded if the proposed Kootenai Falls project is constructed. Although less than 2,500 acres were purchased as mitigation under PL93-251, there is only a remote chance that Congressional authorization and appropriation to purchase additional acreage up to 12,000 acres will occur. The sentiment of the current administration of Washington D.C. is for fewer government expenditures. There is also the general opposition by the public in Lincoln County to loss of more private land.

Studies to evaluate big game habitat manipulations (Campbell 1972a, 1972b; Campbell and Knoche 1974; Knoche 1974; and Knoche and Brown 1975) carried out by the U.S. Forest Service to improve winter range conditions on potential relocation sites for displaced animals, and on existing ranges, found that the procedures employed (primarily spring broadcast burning) failed to achieve desired results. Knoche and Brown (1975) found that big game use of treated areas has been less than on control areas and that there has been no demonstrable increase in game animal numbers on residual winter ranges for various reasons. They further state that habitat lost through impoundment was removed from the total land base capable of supporting big game resource and that animals forced from ancestral ranges did not simply resettle on adjacent ranges, but were gradually lost from the population. Population composition and fawn production data collected by Knoche and Brown (1975) were also indicative of a declining population.

Management Goals and Objectives

Fisheries

The fish program goal is to perpetuate aquatic species and their ecosystems and meet the public demand for fish in state waters. To meet this goal, aquatic communities and their habitat must be preserved, protected, and enhanced where feasible. Management is designed to equitably distribute angling opportunity.

Quality habitat is the key to fish populations. Preservation and protection of present habitat and restoration of degraded habitat (where feasible) is a very high priority. Fish habitat and populations should be managed on a drainage wide basis. For example, small tributaries used for spawning, larger streams used as fish passageways, and large rivers used for rearing are interrelated and must all be preserved to maintain migratory populations of fish that are common in Montana. Important components of fish habitat which must be maintained include; water quality, water quantity, physical integrity of stream channels and lakeshores, stream or lakeside vegetation, and adequate passage for migratory fish.

Specific objectives for the Kootenai drainage are:

1. To maintain the present 4,000 cfs minimum flow requirement

2. To maintain fish populations in the river and reservoir at no less than present levels; and

3. To protect the remaining river habitat.

Studies conducted during and after construction of Libby Dam have resulted in several recommendations to maintain excellent fisheries in the Kootenai River and Lake Koocanusa. The recommendations include:

1. Maintenance of a 4,000 cfs minimum flow below Libby Dam.

2. Constraints on the rate of which river level fluctuations may occur; and

3. Constraints on operation of the Libby Dam selective withdrawal system to enhance water temperatures in the Kootenai River while avoiding excessive downstream fish loss from the reservoir.

Wildlife

To protect, maintain, and enhance the available supply of all wildlife species and their habitats in the project area in order to meet the demand for all types of wildlife-oriented recreation.

Recommendations to Protect, Mitigate, and Enhance Fish and Wildlife Resources

Fisheries

1. Existing criteria on operations of Libby Dam for fisheries should be maintained unless conditions warrant a change in operation that would benefit the fishery (1.2.5).

The present criteria have proved to be adequate for maintaining good fish populations in the Kootenai River and Lake Koocanusa. However, fish populations in both the river and reservoir are still adjusting to post-impoundment conditions. Operational constraints may have to be modified as populations stabilize or conditions warrant.

2. Studies to determine instream flows adequate to insure successful immigration, emigration, spawning, and rearing of rainbow and cutthroat trout to tributaries of the Kootenai River and Lake Koocanusa should be initiated (1.3.1).

3. Periodic removal of aggrading material in Kootenai River tributary deltas should be undertaken (1.5.1).

Migration, corridors, spawning areas and rearing areas in tributaries of the Kootenai River and Lake Koocanusa must be maintained to encourage wild trout production. Instream flow reservations would guarantee ample water supply to maintain tributary habitat quality.

Instream flows for fish and wildlife are classified as beneficial uses of water in Montana and state law provides for instream flow reservations. Instream flow studies should be initiated on the following Kootenai River tributaries: Callahan, Quartz, Libby and O'Brien creeks, and the Fisher River. Lake Koocanusa tributaries of concern are Graves, Deep, Sinclair, Big, Bristow, Barron, and Five-Mile creeks.

Actions should be taken to improve access to tributary streams. Lack of spring scouring flows in the Kootenai River since impoundment has caused aggradation of materials at the mouths of many tributaries.

As these deltas continue to aggrade, access to the tributaries by migrating fish could be impaired.

4. Effects of Libby Dam operation on reproduction and rearing of white sturgeon in the Kootenai River should be assessed (1.2.6).

White sturgeon have been recommended for inclusion on the Montana endangered species list (Graham 1981b). The population of sturgeon below Kootenai Falls appears to have decreased since impoundment of the river. Studies should be undertaken to determine the status of the population, what effects Libby Dam has upon the population, and what can be done to preserve white sturgeon.

Wildlife

The primary recommendation for mitigating wildlife losses resulting from the construction of the project would be to obtain the balance of the 12,000 acres authorized for this purpose by PL 93-251. Suitable lands in the general area of the project could be acquired as they become available and/or management rights to private and/or public lands in the vicinity could be negotiated as described below. Since the 12,000 acres authorized for acquisition is less than the acreage lost through flooding this is the minimum recommended acreage to acquire and/or obtain such rights to.

For replacement of lost wildlife values to be realized through habitat improvement, either on-site or off-site, a larger acreage of land will usually be required than that actually flooded, even if intensively managed. This is due to two factors. First, the riparian habitat lost is generally more productive than replacement lands, and second, in most cases the lands to be managed are already occupied and superimposing new populations on those present will required more than a simple acre-for-acre replacement, plus intensive management.

On-site

Habitat manipulation on project lands to improve food and/or cover for various species of wildlife could help offset some of the wildlife values lost through construction of this project. Species to be managed for and appropriate techniques would have to be determined prior to initiating such practices.

Creation of permanent, relatively shallow water ponds, especially near the U.S.-Canada border, through construction of dikes to retain water during drawdowns or by trapping water from small streams or springs could benefit many species. Islands that would be above the high water level could be constructed at the same time as dikes, and would provide nesting waterfowl with additional nest sites. Stabilization of water levels behind such dikes would allow submerged and emergent aquatic vegetation to establish themselves, along with cottonwoods, willows, etc. along shorelines. This would benefit many species, especially

aquatic furbearers and nongame in addition to waterfowl. If deep enough to support fish year-round, such areas might also provide additional and/or better foraging areas for osprey and bald eagles nesting in the vicinity.

Opportunities for on-site improvement of wildlife values on existing projects are limited to project waters and generally narrow land boundaries. As an alternative to on-site activities and/or to further improve the wildlife values in the project vicinity, off-site enhancement of a designated species, or group of species, as compensation for previously unmitigated wildlife losses may be necessary.

Off-site

See recommendations for Hungry Horse or Kerr Projects.

GENERAL RECOMMENDATIONS

PROGRAM DEVELOPMENT

1. The Council should consider the water needs of the fish and wildlife resources in the State of Montana and effects on these resources of any suggested changes in allocation of historical water storage for any downstream uses for power, flood storage, fish and wildlife or other uses (1.8.3).

A major concern in the development of the fish and wildlife program will be insuring adequate flows in the lower and middle Columbia River Basin for fish passage. The Council should not limit itself to consideration of existing up-river storage projects to meet those needs. Rather the Council should investigate the possibility of building storage capacity in the affected river basins. Montana's fish and wildlife has been impacted considerably from construction of existing projects and operational changes that would negatively impact the remaining resources should be avoided as a first priority.

2. The Council should consider the impacts of advanced energy withdrawal from storage reservoirs on reservoir and downstream fish and wildlife resources to insure that an effective fish and wildlife program can be implemented (5.3).

Industrial users (D.S.I.s) can request advanced energy withdrawal from Bonneville Power Administration which has led to early drafting of Hungry Horse Reservoir in the past. It is probable that this early draft (July and August) would leave insufficient quantities of water in the reservoir to meet the fish flows and reservoir elevations requested for that project. If these withdrawals occurred independently of the adopted fish and wildlife program, the ability to mitigate for fishery losses through this process would be questionable.

3. The Council should support the development of a process that protects aquatic and wildlife resources of significant value from future hydroelectric development. This would be a form of mitigation for past development needed to establish an essential balance between rivers and reservoirs. Highest priority should go to streams that could not be adequately mitigated (1.9.3).

Class one streams in the Montana portion of the Columbia River Basin are limited in number and valuable as a recreational resource. Most of these streams have some hydroelectric potential. Based on the set of criteria used to rate these streams, the Council should investigate and create, if necessary, a process for protecting these streams under the framework of the Act or support creation of additional legislation.

An additional concern is the protection of mitigation received from existing or future hydro developments. An example is the Kootenai River. As mitigation for Libby Dam, minimum stream flows and limits on rate of river fluctuation were implemented to enhance the fishery

downstream. In recent years, several hydroelectric projects have been proposed on that reach of river. All the projects could have a negative impact on the fishery and could degrade enhancement measures which were mitigation for Libby Dam.

One argument is that each project should be considered on its own merit, or that mitigation for the new project would include replacement of lost mitigation from previous projects. While this sounds logical, the fallacy of the argument can best be demonstrated by looking at the well documented decline of the salmon and steelhead runs in the Columbia River system. Project impacts are cumulative, and no new stream resource is created in the process of mitigation. The only logical conclusion is to protect the best of what is left.

4. The Council should include in the fish and wildlife program a method to insure that mitigation for fish and wildlife losses is a mandatory part of the process of planning, licensing and development of projects (5.1).

Section 4(h)(11)(A) of the Act addresses this subject. The Council should also secure agreement from involved agencies to abide by existing state laws particularly in respect to licensing and exemption of hydroelectric projects.

5. The Council should address the cumulative impacts of existing and future hydro-development in its fish and wildlife program. Cumulative impacts should be addressed at the first level of appraisal before a project is proposed and include a firm commitment to an adequate mitigation plan (5.2).

The Northwest Power Planning Act offers a unique opportunity to bring the issue of cumulative or basin-wide impacts into the planning decision. The data base has often been too limited or the developing agencies have had too narrow a range of accountability for their impacts. Environments can usually rebound from a certain amount of stress, but as the frequency and amount of stress increases, the system begins to collapse. The potential impacts of micro-hydro development might be a good example.

6. Potential site-specific and cumulative impacts of small scale and micro-hydroelectric projects (installed capacity of five megawatts or less) should be evaluated to insure that the resource assessment goals and objectives established by the Council in the Energy Plan are compatible with the intent of the fish and wildlife program (5.4).

The Act identifies conservation and renewable resources as the two top priorities to meet future electric energy needs. Hydroelectric development is viewed as a renewable resource. All indications are that the direction of future hydroelectric development will be small and micro-scale projects.

Concerns were raised at public meetings and by agencies over the potential impacts of these projects on resident migratory fisheries. Issues identified included the potential conflict between a resource assessment plan that would encourage and provide economic incentive to develop these sites and a Fish and Wildlife Program aimed at mitigating existing impacts on migratory fish. Another issue was that the cumulative impact of a number of small-scale developments could have a large impact even if impacts of individual projects are relatively small.

A high priority should go to collecting basin-wide baseline data on the potential impacts of small-scale hydro development on fish and wildlife in areas where development seems imminent or likely. This assessment should include developing passage criteria for affected migratory fish species.

Another important data need is developing a methodology for estimating "flow duration curves" for ungauged streams. Such curves consist of a plot of stream flow versus percentage of time for which a particular flow is exceeded. This information would be useful in assessing hydroelectric power potential and also in determining instream flow requirements to preserve stream habitat and insure successful perpetuation of migratory fish stocks. Guidelines should also be developed which can be used by fish and wildlife agencies and by developers to determine the suitability of specific sites for such projects.

7. Include formal resident fisheries representation in all matters of Columbia River Power System planning, management, and operation to provide equitable treatment for resident fisheries.

Mitigation for Future Projects

This section addresses only wildlife concerns because we felt the impacts on fisheries resulting from the various types of potential projects were too complex to form generalized recommendations in this time frame. Many of the general recommendations or concepts would apply however.

History of Wildlife Concerns

Man's utilization of the land is causing continuous degradation and loss of wildlife habitat throughout the United States. Water development projects are responsible for the loss of a large amount of riparian habitat, especially in the more arid western states where such habitat is at a premium.

Riparian ecosystems are recognized as some of the most productive and diverse ecosystems, capable of producing and supporting impressive vegetative and animal populations (Teskey and Hinckley 1977). In addition to supporting some of the most productive and diverse wildlife populations in the U.S., riparian ecosystems also play an important, if not essential

role in maintaining wildlife populations in adjacent uplands (Hirsch and Segelquist 1978). These wildlife values of riparian ecosystems have long been recognized, and two symposia devoted to protection, preservation and management of remaining riparian zones have recently been held (Johnson and Jones 1977; Johnson and McCormick 1978). Much of the discussion at both of these symposia dealt with the value and importance of riparian ecosystems to various forms of wildlife. Although not part of the main theme of these symposia, mitigation was nevertheless frequently mentioned, especially in the latter (1978) session.

A national symposium devoted to mitigating losses of fish and wildlife habitat was held in 1979 (Swanson 1979). In the preface to this symposium, Melander and Swanson (1979) describe how fish and wildlife conservationists have been deeply concerned for years about habitat losses resulting from large federal development projects but that the Fish and Wildlife Coordination Act (FWCA), designed to minimize or mitigate such losses, has proven to be ineffective in doing so.

Inundation of essential terrestrial wildlife habitats by water development projects represents a major environmental impact due to the significant and permanent commitment of resources. Serious attempts at mitigating wildlife losses from development projects are a relatively recent phenomenon and one which has generally been wholly inadequate in replacing wildlife values lost. Montana is not unique in this regard, as this has apparently been the standard procedure throughout the country as evidenced by continued reference to these failures in many of the papers at the mitigation symposium (see for example Prosser et al. 1979, Broach 1979, Dziedzic and Oliver 1979, and others).

Wildlife Problems

The problems associated with permanent flooding of terrestrial wildlife habitats have been fairly intensively covered in the problem statements related to specific existing projects. However, other impacts associated with dams occur both upstream and downstream from impoundments.

Upstream impacts include deposition of sediment, causing general aggradation of the upstream channel and its tributaries (Simons 1979). This results in a general increase in river bed elevation which in turn increases flood stage and the potential for increased flood damage. This may also result in increased seepage and an increase in water table elevations which can affect riparian vegetation, land use and drainage requirements (Simons 1979). Effects of such upstream changes on wildlife would probably be minimal but essentially beneficial. These would include a tendency to maintain or possibly slightly increase riparian vegetation due to raised water table levels. Some increase in deciduous riparian shrubs and trees would be expected in the delta area where silt and clay deposits form and are above water for a sufficient period annually.

Downstream impacts would be of greater magnitude and would be detrimental from the standpoint of wildlife values. These include

degradation of the downstream channel due to the release of essentially clear (sediment-hungry) water which obtains its equilibrium load by picking up sediment from the streambed and eroding stream banks. Channel degradation increases the gradient of local tributaries, which in turn suffer degradation and increased bank erosion (Simons 1979). Channel changes, channel degradation, and improved drainage may cause a lowering of the flood plain water table and result in changes in vegetation. Destruction of islands and lack of new ones being deposited results in a net loss of habitat affecting many species of wildlife.

Significant adverse impacts on wildlife downstream from a major hydroelectric development in southeastern Montana were documented by Martin (1977). In that study, beaver populations in the unregulated Yellowstone River were larger than those in the Tongue and Bighorn rivers which are both regulated by dams. Depressed beaver populations in the regulated rivers as compared to the unregulated river were related to habitat loss resulting from upstream impoundment. Pre and post-impoundment comparisons on the Bighorn River downstream from Yellowtail Dam revealed significant reductions of islands and gravel bars (51 percent in number and 77 percent in area) and also of vegetated islands (23 percent in number and 31 percent in area) which constitute prime beaver habitat in that area.

Although furbearers were the subject of Martin's (1977) study, habitat losses of that magnitude undoubtedly have a negative impact on a large number of wildlife species.

Recommendations

1. Project design should include acquisition of lands (beyond those strictly essential to project operations) to aid in offsetting project-caused wildlife losses. These should be acquired at the same time as other project lands and be included in basic project costs. The construction agency should grant management easements or rights on these lands to the fish and wildlife agency responsible for the impacted resources, and should also provide funding to permit development, operation, and management of the area for the expected life of the project.

The typically inherent fertility of flood plains and their diverse and productive ecosystems are features that cannot be replaced on the shores of reservoirs. Furthermore, the shoreline areas best suited for habitat improvement are generally pre-empted for other uses. Replacement of lost wildlife values on such lands requires intensive management to successfully superimpose new populations upon already existing ones. Since the most productive areas are lost and less productive lands, even under intensive management, cannot generally substitute for such lost lands on an acre-for-acre basis, replacement acreage will have to be greater than actual acreage lost. In addition, destroyed habitat often serves as essential habitat for animals ranging over much larger areas during noncritical times of the year. An accepted methodology should

be employed to determine the net loss of wildlife values and the amount of mitigation required to offset these losses. The Habitat Evaluation Procedure developed by the U.S. Fish and Wildlife Service (U.S. Department of Interior, Fish and Wildlife Service 1980) may suit this purpose.

Where acquisition and management of on-site project lands is not feasible for various reasons, the following would be recommended.

2. Where the previous recommendation is not feasible, acquisition of lands and/or management rights should be obtained by the construction agency in off-site areas. Management rights to these lands should in turn be conveyed to the fish and wildlife agency responsible for the resources affected.

Where on-site efforts are not feasible it will be necessary to provide intensive off-site management to replace lost wildlife values. However, it may not be necessary to directly acquire lands for this purpose. This region has a considerable amount of land in federal ownership, and if construction agencies could successfully negotiate management rights and delegate these to the appropriate fish and wildlife agency the desired benefits could be obtained at a lower overall cost. Whether actual lands, or only management rights are acquired, development, operations, and management of such areas would be primarily for wildlife, this option would not preclude development of other resources or land uses if compatible with wildlife management objectives.

3. Public hearings should be held to insure that any decisions regarding acceptance or rejection of proposed recommendations to prevent or lessen project-caused impacts on wildlife are made with full public knowledge, input, and review.

In the past, construction agencies have often rejected proposed measures to protect fish and wildlife from project impacts in order to achieve favorable cost/benefit ratios or relieve certain project beneficiaries from funding mitigation costs (Jahn 1979). It is necessary that the public knows the reasoning behind acceptance or rejection of mitigation recommendations and be included in the decision making process.

4. Public access to wildlife mitigation lands for a given project must be assured. Also included should be provision of facilities (i.e., parking areas, boat ramps, etc.) which will allow utilization of these resources by the public.

It makes little sense to develop the resources if public utilization is denied. However, public agencies charged with managing the fish and wildlife resources on these lands should retain the right to restrict the timing and/or mode of public access in order to protect fish and wildlife (i.e. nesting waterfowl).

5. Continuing investigations should be carried out to evaluate the success of post-construction mitigative management efforts.

Such studies are necessary to determine whether ongoing mitigation efforts are accomplishing their goals or not. They can also result in modifications of current management activities and lead to improved decision making regarding such activities on future projects.

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APPENDIX A

Background on the Regional Power Planning Bill and Council

From

Request for Proposal
Package Number 81-001

Pacific Northwest Regional Energy Planning

Background

The hydro resources of the Pacific Northwest (PNW) are no longer sufficient to meet all of the electric power needs of the region. Future growth in electricity demand will therefore have to be satisified by resources other than conventional large hydropower. While the Region has embarked upon the building of a number of thermal power plants, the substantially higher costs and environmental impacts of such plants have raised serious questions regarding the optimum methods for developing resources to satisfy future electricity needs.

The Bonneville Power Administration (BPA), a Federal agency which generates and markets approximately half the electric power consumed in the PNW, has been attempting to take a lead role in the planning, building, and operating of the region's entire electric power system on a coordinated basis. BPA is statutorily required to give preference in the allocation of the Federal resources to co-ops and publicly owned utilities, who are known as the "preference customers". In 1976, BPA's projections of its loads and resources indicated that the Federal resources available would be short for preference customers, and that BPA would no longer be able to guarantee preference customers that their load growth could be met beyond 1983. BPA issued a notice of insufficiency to these customers.

Issues related to the sufficiency of future electric power availability created much controversy in the PNW, and raised numerous questions regarding the institutional aspects of the development, sale, and distribution of electric power from Federal resources. Other important issues such as long term planning for electricity supply, priorities in the development of new resources and coordination of power supply planning also had to be addressed. In an attempt to develop a cooperative solution which preserved local options, while maintaining the benefits of Federal resources and an integrated electric system, several alternatives were explored, but no agreement was easily reached within the PNW. In order to avoid extensive legal battles over complex issues related to the allocation of Federal hydropower resources, the PNW turned to the U.S. Congress for a solution. After much deliberation, including many hearings in the Region, as well as in Washington, D.C., Congress devised methods to protect the preference customers and yet provide the benefits of Federal hydropower to residential and farm customers of private utilities. In 1980, Congress passed the Pacific Northwest Electric Power Planning and Conservation Act (PL96-501).

The Pacific Northwest Electric Power Planning and Conservation Act

The major purposes of the Pacific Northwest Electric Power Planning and Conservation Act are quoted below:

"(1) To encourage, through the unique opportunity provided by the Federal Columbia River Power System -

(A) Conservation and efficiency in the use of electric power, and

(B) The development of renewable resources within the Pacific Northwest:

(2) To assure the Pacific Northwest of an adequate, efficient, economical and reliable power supply;

(3) To provide for the participation and consultation of the Pacific Northwest States, local governments, consumers, customers, users of the Columbia River System (including Federal and State fish and wildlife agencies and appropriate Indian tribes), and the public at large within the Region in -

(A) The development of regional plans and programs related to energy conservation, renewable resources, other resources, protecting, mitigating, and enhancing fish and wildlife resources;

(B) Facilitating the orderly planning of the Region's power system; and

(4) To provide that the customers of the Bonneville Power Administration and their consumers continue to pay all costs of the Region's electric power requirements, including the amortization on a current basis of the Federal investment in the Federal Columbia River Power System;

(5) To insure, subject to the provisions of this Act -

(A) That the authorities and responsibilities of State and local governments, electric utility systems, water management agencies and other non-Federal entities for the regulation, planning, conservation, supply, distribution, and use of electric power shall be construed to limit or restrict the ability of customers to take actions in accordance with other applicable provisions of Federal or State law, including, but not limited to, actions to plan, develop and operate resources and to achieve conservation, without regard to this Act; and

(6) To protect, mitigate and enhance the fish and wildlife, including related spawning grounds and habitat, of the Columbia River and its tributaries, particularly anadromous fish which are of significant importance to the social and economic well-being of the Pacific Northwest and the Nation and which are dependent on suitable environmental conditions substantially obtainable from the management and operation of the Federal Columbia River Power System and other power generating facilities on the Columbia River and its tributaries."

The Act directs that BPA should continue its traditional role of generating, transmitting, and marketing power; as well as carry out additional responsibilities. Under the Act, BPA must acquire all necessary energy resources to serve utilities who choose to apply to BPA for wholesale power supplies. BPA remains accountable to the residents of the PNW for the actions it takes to meet the Region's electric power needs. The Act contains checks and balances to insure that all customers of BPA are treated equitably. The Act establishes the Pacific Northwest Electric Power and Conservation Planning Council to develop a Regional Plan which will emphasize the development of conservation and renewable resources. The council consists of two members from each of the four Northwest States (Washington, Oregon, Idaho and Montana) and thus

emphasizes local control of resource development options. The major provisions of the Act are summarized below:

-The Council will draw up a regional plan for meeting the electrical needs of the region, taking into account the social and economic effects of alternative courses of action. The plan must give highest priority to cost-effective conservation, treating it as a resource preferable to all other means of responding to demand for electricity. Renewable sources of energy must be given next highest priority in the Region's power planning, to the extent that they are cost-effective ranking ahead of conventional thermal generating resources. Among thermal options, fuel-efficient methods of producing energy must be given priority.

-BPA becomes responsible for meeting the loads of customers and managing the regional electrical system to achieve the purposes of the Act relating to fish, system efficiency and experimental projects. BPA must give priority to cost-effective conservation and renewable resources in meeting the Region's needs. BPA may also purchase the generating capabilities of new thermal projects, but only after determinination that they are required in addition to all cost-effective conservation and renewables that can be achieved or developed in time. Such projects must also be found reliable and compatible with the regional electric system. BPA will spread the benefits and the costs of resources among all of its customers through its rates.

-The supply preference and resulting price advantages to co-ops and publicly owned utilities by Federal law are protected and enhanced. BPA is given the responsibility of meeting the full future requirements of preference customers -- something BPA was not previously authorized to do.

-The residential and farm customers of investor-owned utilities will receive rate relief. The utilities sell to Bonneville, at the average cost of their power, an amount of electric energy equal to their residential and farm loads. BPA will sell to them, in return, enough energy at BPA standard rates to cover these residential and farm loads. The rate advantages cannot enhance company profits, but must be passed on directly to the customers.

-Direct service industries will receive new 20-year contracts for power from BPA, but at a higher price than they are paying under existing contracts. They will, in effect, pay the cost of rate relief to the residential and farm customers of investor-owned utilities during the first four years, and a substantial portion thereafter, which they agreed to do in exchange for assurances of long-term supplies.

-BPA will sell electricity at a rate that reflects the melded cost of Federal hydropower and more expensive thermal resources, conservation and renewable sources of energy. The Act contains incentives, as well, to encourage conservation and renewables. BPA may credit utilities for their individual actions to implement conservation and renewables.

-The Council will establish a program to protect and enhance the fisheries resources of the Columbia River and to mitigate damage already done to anadromous fish. Funding for the program is to come from BPA rate revenue.

-All planning for electric resources and fish protection must involve the public. State and local control of land use and water rights is protected under the Act and the decision to allow construction of new resources is left with utilities and state siting authorities.

Role and Responsibilities of the Council

The Pacific Northwest Electric Power Planning and Conservation Act (Regional Act) has estalbished the Pacific Northwest Electric Power and Conservation Planning Council, which comprises of two voting members representing each of the States of Washington, Oregon, Idaho, and Montana. The major task of the Council is ot adopt a regional electric power and conservation plan ("Regiona plan" or "the plan") within two years, and to update it periodically. Section B describes in detail the requirements of the Regional energy plan and a functional description of the plan as prepared by the Council. The plan, adopted by the Council, becomes the basis for BPA's actions in meeting the loads of its customers in the PNW. If BPA wants to acquire resources not consistent with the plan, specific Congressional approval will be required prior to any commitment to BPA.

The Regional plan will represent the Council's blueprint for meeting the Region's future electrical energy needs. The plan is not envisioned to be a static document and the Council may amend it from time to time, as is required under tha Act to review the plan at least every five years. The Act also provides additional definition of the role and responsibilities of the Council, some of which are highlighted below.

Public Involvement

The Act requires that the public be given opportunities to present information and views to the Council before any major decisions are made. The Council must reglarly inform the public of its objectives, organization, and activities. Before adopting the Plan, the Council must hold public hearings in Washington, Oregon, Idaho, and Montana. The Council is required to maintain a comprehensive and continuing program to ensure widespread public involvement in the policymaking process. It must also solicit advise from BPA, utilities, state agencies, regulatory commissions, and others.

Planning Priorities

The Act mandates the Council to adopt a plan which requires investment in all cost-effective conservation and renewable resources before investment in conventional resources such as fossil fuel and nuclear plants. The following order of priorities is set up in the Act:

1. Conservation

2. Renewable resources

3. Resources relying on waste heat from industrial processes or in conventional fuels used in high-efficiency conversion processes.

4. Other resources.

Conservation is provided at 10% of premium over conventional resources. In other words, conservation is considered to be cost-effective, even if the cost of conservation measures is as high as 110% of the costs of conventional generation.

Environmental Considerations

The Act requires that the Council carefully weigh environmental impacts of proposed projects. The Act requires that the Council strike a healthy balance between environmental and energy needs in all of its decisions.

Fish and Wildlife

Because of the importance of questions related to migratory fish in the Columbia and other rivers in the PNW, protection of fish and wildlife is an important aspect of the Act. The Act provided the means for interested parties to cooperatively work out a plan for enhancing fish runs and wildlife dependent on PNW rivers. The Council must, in completing the Regional Plan, seek recommendations from Federal and state fisheries agencies and Indian tribes for a fish management program, and adopt a program to protect, mitigate, and enhance fish and wildlife. This program and related considerations will affect the development of new power resources.

Compatibility with the Regional Energy System

In developing the plan, the Council must consider whether the proposed resources are compatible with the operating realities such as the reliability and the need for reserves of the existing Regional Electric Energy System.

Goal Statement

The goal statement provided below paraphrases the requirements of the Regional Act and is intended to make more clear what the Council is attempting to accomplish through the planning process.

The mission of the Northwest Planning Council is threefold:

1. To provide accountable leadership in electricity planning and policy formulation for the Pacific Northwest.

2. To plan for the management of electricity demand and supply to sustain such growth of the economy as is anticipated and to sustain a healthy environment, at the lowest total cost.

3. To secure regional consensus on energy development and utilization.

Therefore, under the authority of PL 96-501 and the appropriate state laws, the Council will pursue the following goals:

-To provide an adequate, reliable and cost-effective supply of electricity.

-To protect and enhance environmental quality.

-To secure implementation of all cost-effective electricity conservation.

-To stimulate the development and implementation of cost-effective renewable and alternative energy resources, both as a source of electricity and as a substitute for electricity.

-To increase the stocks of anadromous fish on the Columbia River and other Northwest rivers, balancing the needs of the region for both fish and power production.

-To review the cost-effectiveness of the basic assumptions underlying the planning and operation of the region's electricity supply system.

-To provide public education about regional electric power issues, particularly future rate impacts.

-To facilitate and encourage public participation in resolution of these issues.

-To maintain low rates made possible by the hydropower development in the Pacific Northwest while stimulating investment and consumption decisions as if rates reflected the high costs of new thermal resources.

-To provide a stable planning environment for prompt, conclusive decisions on electric energy issues.

-To prepare a demand forecast with sufficient end-use detail so that conservation progress can be monitored and evaluated on a continuing basis.

-To identify and eliminate institutional barriers to the implementation of cost-effective conservation and renewable resources.

-To develop a reliable power plan which realistically can be supported by the regional economy and national capital markets.

APPENDIX B

A Portion of the Pacific Northwest Electric Power Planning and Conservation Act Regarding the Fish and Wildlife Program

(h)(1)(A) The Council shall promptly develop and adopt, pursuant to this subsection, a program to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River and its tributaries. Because of the unique history, problems, and opportunities presented by the development and operation of hydroelectric facilities on the Columbia River and its tributaries, the program, to the greatest extent possible, shall be designed to deal with that river and its tributaries as a system.

(B) This subsection shall be applicable solely to fish and wildlife, including related spawning grounds and habitat, located on the Columbia River and its tributaries. Nothing in this subsection shall alter, modify, or affect in any way the laws applicable to rivers or river systems, including electric power facilities related thereto, other than the Columbia River and its tributaries, or affect the rights and obligations of any agency, entity, or person under such laws.

(2) The Council shall request, in writing, promptly after the Council is established under either section 4(a) or 4(b) of this Act and prior to the development or review of the plan, or any major revision thereto, from the Federal, and the region's State, fish and wildlife agencies and from the region's appropriate Indian tribes, recommendations for—

(A) measures which can be expected to be implemented by the Administrator, using authorities under this Act and other laws, and other Federal agencies to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, affected by the development and operation of any hydroelectric project on the Columbia River and its tributaries;

(B) establishing objectives for the development and operation of such projects on the Columbia River and its tributaries in a manner designed to protect, mitigate, and enhance fish and wildlife; and

(C) fish and wildlife management coordination and research and development (including funding) which, among other things, will assist protection, mitigation, and enhancement of anadromous fish at, and between, the region's hydroelectric dams.

(3) Such agencies and tribes shall have 90 days to respond to such request, unless the Council extends the time for making such recommendations. The Federal, and the region's, water management agencies, and the region's electric power producing agencies, customers, and public may submit recommendations of the type referred to in paragraph (2) of this subsection. All recommendations shall be accompanied by detailed information and data in support of the recommendations.

(4)(A) The Council shall give notice of all recommendations and shall make the recommendations and supporting documents available to the Administrator, to the Federal, and the region's, State fish and wildlife agencies, to the appropriate Indian tribes, to Federal agencies responsible for managing, operating, or regulating hydroelectric facilities located on the Columbia River or its tributaries, and to any customer or other electric utility which owns or operates any such facility. Notice shall also be given to the public. Copies of such recommendations and supporting documents shall be made available for review at the offices of the Council and shall be available for reproduction at reasonable cost.

(B) The Council shall provide for public participation and comment regarding the recommendations and supporting documents, including an opportunity for written and oral comments, within such reasonable time as the Council deems appropriate.

(5) The Council shall develop a program on the basis of such recommendations, supporting documents, and views and information obtained through public comment and participation, and consultation with the agencies, tribes, and customers referred to in subparagraph (A) of paragraph (4). The program shall consist of measures to protect, mitigate, and enhance fish and wildlife affected by the development, operation, and management of such facilities while assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply. Enhancement measures shall be included in the program to the extent such measures are designed to achieve improved protection and mitigation.

(6) The Council shall include in the program measures which it determines, on the basis set forth in paragraph (5), will—

(A) complement the existing and future activities of the Federal and the region's State fish and wildlife agencies and appropriate Indian tribes;

(B) be based on, and supported by, the best available scientific knowledge;

(C) utilize, where equally effective alternative means of achieving the same sound biological objective exist, the alternative with the minimum economic cost;

(D) be consistent with the legal rights of appropriate Indian tribes in the region; and

(E) in the case of anadromous fish—

(i) provide for improved survival of such fish at hydroelectric facilities located on the Columbia River system; and

(ii) provide flows of sufficient quality and quantity between such facilities to improve production, migration, and survival of such fish as necessary to meet sound biological objectives.

(7) The Council shall determine whether each recommendation received is consistent with the purposes of this Act. In the event such recommendations are inconsistent with each other, the Council, in consultation with appropriate entities, shall resolve such inconsistency in the program giving due weight to the recommendations, expertise, and legal rights and responsibilities of the Federal and the region's State fish and wildlife agencies and appropriate Indian tribes. If the Council does not adopt any recommendation of the fish and wildlife agencies and Indian tribes as part of the program or any other recommendation, it shall explain in writing, as part of the program, the basis for its finding that the adoption of such recommendation would be—

(A) inconsistent with paragraph (5) of this subsection;

(B) inconsistent with paragraph (6) of this subsection; or

(C) less effective than the adopted recommendations for the protection, mitigation, and enhancement of fish and wildlife.

(8) The Council shall consider, in developing and adopting a program pursuant to this subsection, the following principles:

(A) Enhancement measures may be used, in appropriate circumstances, as a means of achieving offsite protection and mitigation with respect to compensation for losses arising from the development and operation of the hydroelectric facilities of the Columbia River and its tributaries as a system.

(B) Consumers of electric power shall bear the cost of measures designed to deal with adverse impacts caused by the development and operation of electric power facilities and programs only.

(C) To the extent the program provides for coordination of its measures with additional measures (including additional enhancement measures to deal with impacts caused by factors other than the development and operation of electric power facilities and programs), such additional measures are to be implemented in accordance with agreements among the appropriate parties providing for the administration and funding of such additional measures.

(D) Monetary costs and electric power losses resulting from the implementation of the program shall be allocated by the Administrator consistent with individual project impacts and system-wide objectives of this subsection.

(9) The Council shall adopt such program or amendments thereto within one year after the time provided for receipt of the recommendations. Such program shall also be included in the plan adopted by the Council under subsection (d).

(10)(A) The Administrator shall use the Bonneville Power Administration fund and the authorities available to the Administrator under this Act and other laws administered by the Administrator to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries in a manner consistent with the plan, if in existence, the program adopted by the Council under this subsection, and the purposes of this Act. Expenditures of the Administrator pursuant to this paragraph shall be in addition to, not in lieu of, other expenditures authorized or required from other entities under other agreements or provisions of law.

(B) The Administrator may make expenditures from such fund which shall be included in the annual or supplementary budgets submitted to the Congress pursuant to the Federal Columbia River Transmission System Act. Any amounts included in such budget for the construction of capital facilities with an estimated life of greater than 15 years and an estimated cost of at least $1,000,000 shall be funded in the same manner and in accordance with the same procedures as major transmission facilities under the Federal Columbia River Transmission System Act.

(C) The amounts expended by the Administrator for each activity pursuant to this subsection shall be allocated as appropriate by the Administrator, in consultation with the Corps of Engineers and the Water and Power Resources Service, among the various hydroelectric projects of the Federal Columbia River Power System. Amounts so allocated shall be allocated to the various project purposes in accordance with existing accounting procedures for the Federal Columbia River Power System.

(11)(A) The Administrator and other Federal agencies responsible for managing, operating, or regulating Federal or non-Federal hydroelectric facilities located on the Columbia River or its tributaries shall—

(i) exercise such responsibilities consistent with the purposes of this Act and other applicable laws, to adequately protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, affected by such projects or facilities in a manner that provides equitable treatment for such fish and wildlife with the other purposes for which such system and facilities are managed and operated;

(ii) exercise such responsibilities, taking into account at each relevant stage of decisionmaking processes to the fullest extent practicable, the program adopted by the Council under this subsection. If, and to the extent that, such other Federal agencies as a result of such consideration impose upon any non-Federal electric power project measures to protect, mitigate, and enhance fish and wildlife which are not attributable to the development and operation of such project, then the resulting monetary costs and power losses (if any) shall be borne by the Administrator in accordance with this subsection.

(B) The Administrator and such Federal agencies shall consult with the Secretary of the Interior, the Administrator of the National Marine Fisheries Service, and the State fish and wildlife agencies of the region, appropriate Indian tribes, and affected project operators in carrying out the provisions of this paragraph and shall, to the greatest extent practicable, coordinate their actions.

(12)(A) Beginning on October 1 of the first fiscal year after all members to the Council are appointed initially, the Council shall submit annually a detailed report to the Committee on Energy and Natural Resources of the Senate and to the Committees on Interstate and Foreign Commerce and on Interior and Insular Affairs of the House of Representatives. The report shall describe the actions taken and to be taken by the Council under this Act, including this subsection, the effectiveness of the fish and wildlife program, and potential revisions or modifications to the program to be included in the plan when adopted. At least ninety days prior to its submission of such report, the Council shall make available to such fish and wildlife agencies, and tribes, the Administrator and the customers a draft of such report. The Council shall establish procedures for timely comments thereon. The Council shall include as an appendix to such report such comments or a summary thereof.

(B) The Administrator shall keep such committees fully and currently informed of the actions taken and to be taken by the Administrator under this Act, including this subsection.

(i) The Council may from time to time review the actions of the Administrator pursuant to sections 4 and 6 of this Act to determine whether such actions are consistent with the plan and programs, the extent to which the plan and programs is being implemented, and to assist the Council in preparing amendments to the plan and programs.

(j)(1) The Council may request the Administrator to take an action under section 6 to carry out the Administrator's responsibilities under the plan.

(2) To the greatest extent practicable within ninety days after the Council's request, the Administrator shall respond to the Council in writing specifying—

(A) the means by which the Administrator will undertake the action or any modification thereof requested by the Council, or

(B) the reasons why such action would not be consistent with the plan, or with the Administrator's legal obligations under this Act, or other provisions of law, which the Administrator shall specifically identify.

(3) If the Administrator determines not to undertake the requested action, the Council, within sixty days after notice of the Administrator's determination, may request the Administrator to hold an informal hearing and make a final decision.

(k)(1) Not later than October 1, 1987, or six years after the Council is established under this Act, whichever is later, the Council shall

complete a thorough analysis of conservation measures and conservation resources implemented pursuant to this Act during the five-year period beginning on the date the Council is established under this Act to determine if such measures or resources:

(A) have resulted or are likely to result in costs to consumers in the region greater than the costs of additional generating resources or additional fuel which the Council determines would be necessary in the absence of such measures or resources;

(B) have not been or are likely not to be generally equitable to all consumers in the region; or

(C) have impaired or are likely to impair the ability of the Administrator to carry out his obligations under this Act and other laws, consistent with sound business practices.

(2) The Administrator may determine that section 3(4)(D) shall not apply to any proposed conservation measure or resource if the Administrator finds after receipt of such analysis from the Council that such measure or resource would have any result or effect described in subparagraph (A), (B) or (C) of paragraph (1).

APPENDIX C

Criteria employed in evaluating the quality
of stream fishery resources in Montana
(U.S. Department of Interior, Geological Survey 1980).

Fish habitats were assigned to one of six value classes:

Value Class	Class definition
I	Highest-value fishery resource
II	High priority fishery resource
III	Substantial fishery resource
IV	Moderate fishery resource
V	Limited fishery resource
VI	Not yet classified

CRITERIA

1. Occurrence of State or Federal endangered species.

2. Occurrence of State or Federal threatened species.

3. Species of high interest to the State.

4. Habitat restoration, reclamation, or mitigation potential.

A value class was determined for criteria 3 and 4 (above) as follows:

3. Species of High Interest:

Value Class I — Habitat maintaining outstanding populations of species of high interest. To include self-sustaining "wild" populations that maintain a high yield or represent an exceptional aesthetic, scientific, economic, educational, or recreational value.

Value Class II — Priority habitat for highly valued species and/or outstanding habitat for less highly valued species.

Value Class III — Substantial habitat for highly valued species and/or priority habitat for less highly valued species.

Value Class IV — Moderate habitat for highly valued species and/or substantial habitat for less highly valued species.

Value Class V — Limited fish habitat.

4. Habitat Restoration, Reclamation, or Mitigation Potential.

Value Class I — Very low or essentially no potential for restoration or reclamation of the habitat to its present species composition and population levels, no alternate resource could be introduced that would be as highly valued; no

acceptable options are available to compensate for the loss of this habitat, at the present time (includes stream reaches that have been designated as habitat for reintroduction of an endangered species by a National Recovery Team or State Rehabilitation Plan).

Value Class II — Low potential for restoration to present species composition and population levels; however, partial compensation options can be defined.

Value Class III — Moderate potential exists for either restoration of the habitat or reclamation to an equal or higher valued fishery, or total compensation options can be defined.

Value Class IV — Current technology makes it probable that the area can be restored or reclaimed to at least an equally valued fishery as that existing prior to development. Acceptable compensation options are likely.

APPENDIX D

The letters in this appendix contain comments on the final draft of the main body of this report. Therefore it was not possible for the report to address any of the specific issues raised in these final comments.

MONTANA POWER COMPANY MPC GENERAL OFFICES 40 EAST BROADWAY BUTTE MONTANA 59701 • TELEPHONE 406 723-5421

November 3, 1981

Mr. Pat Graham
Chairman, Montana Fish, Wildlife, and Power Ad Hoc Committee
Montana Department of Fish, Wildlife, and Parks
P.O. Box 67
Kalispell, Montana 59901

Dear Pat,

Enclosed are The Montana Power Company's comments on the final Montana recommendations for The Fish and Wildlife Program to be submitted to the Pacific Northwest Electric Power and Conservation Planning Council. We welcome the opportunity to offer our comments for your consideration and commend the work it has taken to make this a cooperative effort. Our role in the development of recommendations has been advisary and will continue in that manner.

Although no specific recommendations have been made to modify hydroelectric operations, it is likely that such restrictions will be suggested when the proposed studies are completed. It remains to be seen if operational modifications will affect generation of power by Montana Power Company. We believe that the Regional Power Act (RPA) does not grant the Council, Bonneville Power Administration or the Federal Energy Regulatory Commission any more authority than each possessed prior to the Act's passage to impose non-power restrictions on non-federal hydro projects. Our belief arises in part from comments made on the floor of the Senate during a November 19, 1980 colloquy between Senator McClure and Senator Jackson. This legislative history is discussed in some detail in Montana Power Company's comments dated October 14, 1981 to your draft program. The essense of that colloquy was "... a federal agency cannot cite any provision of this bill (RPA) as a legal basis for proposing or imposing... a modification in any pending proceedings or in any future proceedings relating to such existing licenses." (See the Congressional Record, S14698-99 November 19, 1980.)

The production of power is the principle and intended use of the facilities licensed under the directive of the Federal Power Act and the concern for fish and wildlife cannot usurp that priority. However, fish and wildlife values are important, and have received a great deal of consideration by the Federal Energy Regulatory Commission, along with other river uses for which the project can be beneficially operated.

The document includes recommendations of the confederated Salish and Kootenai Tribes (CSKT). This is the first opportunity we have had to comment on their recommendations. We do not feel that specific comments are appropriate in this letter and we reserve the right to make specific comments at a later date. However, we do have three general comments that will be stated here:

1) We question the appropriateness of including historical and cultural comments in a fish and wildlife document.

2) There are a number of statements made that are questionable because of a lack of supporting information.

3) We agree with the approach of recognizing the economic importance of hydropower in these recommendations.

We reserve the right to comment on the General Recommendations. These recommendations are not specific and do not allow us to determine the impact they will have on our operations. We will continue to provide input as the details of these concepts may be developed, and we will continue to cooperate to meet and discuss specific ways in which these recommendations may be implemented.

We agree with the recommendations of the Montana Department of Fish, Wildlife, and Parks for the Flint Creek, Milltown, and Kerr projects. The comments that we have submitted have been incorporated into these recommendations to a large degree. We cannot agree with all the recommendations for the Thompson Falls Project. We agree with the approach of a study to determine the most feasible method of improving the fishery. But we cannot agree with the recommendations for compensation in the "off-site" section. Compensation must be based on a quantified loss and there has not been prior studies to quantify the projects' impacts. Furthermore we will not agree to open-ended compensation goals, such as a "significant river fishery" and a "significant migratory fishery". We cannot agree to preclude any streams from hydroelectric development. We feel that each project should be evaluated for its impact and that fish and wildlife concerns should be fully considered and integrated into the planning and operational process.

The Regional Power Act presents a unique opportunity to comprehensively study the ways in which the fish and wildlife resources of the Columbia River system can be protected, mitigated, and enhanced while recognizing the value and importance of a reliable hydroelectric power supply to the region. We are pleased to have been a part of this first step in this process and anticipate continued involvement.

Sincerely,

Frank J. Pickett

Frank J. Pickett
Sr. Biologist

FJP/ch

cc: J.A. McElwain
R.J. Labrie
M.M. Ryan
J.F. Walsh
R.L. Miller
D.B. Gregg
L.H. Gruel
R.T. Oleary

United States Department of the Interior
BUREAU OF RECLAMATION
~~WATER AND POWER RESOURCES SERVICE~~
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724

IN REPLY REFER TO: PN 150
122.-

OCT 30 1981

Patrick Graham, Chairman
Montana Fish, Wildlife and Power
Ad Hoc Committee
Montana Department of Fish,
Wildlife and Parks
Region One
P.O. Box 67
Kalispell, Montana 59901

Dear Mr. Graham:

I wish to compliment you on the preparation of the Montana recommendations for a Fish and Wildlife Program for the Pacific Northwest Electric Power and Conservation Planning Council.

The government agency and public participation was outstanding. We fully endorse the concepts you have presented and the manner in which you conducted the investigations.

Although we cannot guarantee to meet all of your requests due to lack of information and various restraints on our projects, we will strive to accommodate them whenever possible.

Our final comments concerning your fish and wildlife recommendations to the Power Council are enclosed.

Sincerely yours,

John W. Keys, III

ASSISTANT Regional Director

Enclosure

HUNGRY HORSE DAM

Recommendations to Protect, Mitigate, and Enhance Fish and Wildlife Resources

Fisheries

1. Hungry Horse Dam should be operated to insure successful reproduction of kokanee in the Flathead River as follows (1.1.1):

Spawning--Flow at Columbia Falls should be not less than 4,000 ft^3/s and not more than 4,500 ft^3/s between the hours 1700 and 2400 throughout the spawning season (October-November). From 2400 to 1700 hours, the flow may exceed 4,500 ft^3/s but should never be less than 2,500 ft^3/s.

Incubation--A minimum flow of at least 2,500 ft^3/s at Columbia Falls should be maintained 24 hours per day from December 1 through March 31.

Emergence--A minimum flow of not less than 4,000 ft^3/s at Columbia Falls should be maintained 24 hours per day from April 1 until combined flows of the North and Middle Fork Flathead River exceed 4,000 ft^3/s.

During our feasibility study, programed to begin in fiscal year 1982, we will strive to formulate a plan that will provide improved fish conditions in the Flathead system and increased power generation capability at the Hungry Horse Project. Based on preliminary studies, the addition of a reregulating dam and reservoir below Hungry Horse Dam holds promise for significantly improved flow conditions in the main stem Flathead River during periods critical to kokanee reproduction and survival.

Based on a superficial examination of flow data, it looks as though the proposed spawning and emergence flows would be possible under the scenarios envisioned for future Hungry Horse operations. However, based on our previous studies, it does not appear the proposed incubation flows could be provided by the reregulating reservoir alone. Flows of this magnitude would most likely require some increase in minimum flow releases from Hungry Horse and an accompanying redistribution of flows for power generation.

Until we have better data on the reregulating reservoir capacity and have conducted more extensive operation studies, we will not know for sure what the potential and limitations of the reregulating project will be. The possibilities of providing these flows with the reregulating project alone and/or changes in the operation of Hungry Horse Project and their impact on downstream power generation will be evaluated in the feasibility study. We believe that it is appropriate to fully evaluate this operational scenario so the impacts and tradeoffs upon multiple-purpose project operations are available for use in the decisionmaking process.

2. *A minimum flow of at least 2,500 ft^3/s in the Flathead River at Columbia Falls should be maintained 24 hours per day from July 1 through October 31 (1.1.2).*

Although we have not had the opportunity to properly evaluate this proposal, we believe this flow could be achieved with the reregulating project without increasing minimum flows from Hungry Horse. However, operation studies are needed before we would actually know whether flows from Hungry Horse Reservoir would also be needed to meet the above recommendations.

3. *Effects of amount and timing of controlled discharges from Hungry Horse Dam on distribution and migration of kokanee spawners in the Flathead River should be quantified (2.2.1).*

We understand that recommendation 3 is a proposed study objective for a Bonneville Power Administration-Montana Department of Fish, Wildlife, and Parks' study contract to commence in fiscal year 1982. This study will define the significance of Flathead Lake to the overall kokanee production in Flathead basin, plus continue some Flathead River kokanee research. We support recommendation 3.

4. *Construction of a kokanee spawning channel in the South Fork Flathead River should be considered (1.8.1).*

It has been our understanding that the fishery values in the South Fork below Hungry Horse Dam are very low. If a spawning channel is to be considered, we believe that justification for this measure should be documented.

In our Hungry Horse feasibility study, we will be looking to a reregulating dam as the principal measure for fishery improvement. If we are to consider the spawning channel in our feasibility study, the justification for and cost effectiveness of such a facility will need to be demonstrated.

5. *Critical habitat areas in North and Middle Fork Flathead River tributaries should be protected from any development that could not guarantee the project would not adversely affect gamefish rearing habitat (1.9.1).*

We do not feel present or future operations at Hungry Horse Project with or without additional generating capacity will affect the preceding recommendation.

6. *Drawdown of Hungry Horse Reservoir should not exceed 85 feet (1.2.1).*

At present, the average drawdown of Hungry Horse Reservoir is about 80 feet. However, meeting future power loads may cause increased drawdown of the reservoir. In addition, reservoir drawdown could possibly increase to meet the previously mentioned instream flow recommendations for fishery needs. The tradeoffs of not drafting the reservoir more than 85 feet versus instream fish flow and power needs should be evaluated in the feasibility study before a decision is made regarding this proposal.

Wildlife

A study should be initiated to assess potential areas where management of wildlife could be considered as mitigation of habitat lost by construction of Hungry Horse Dam and make appropriate recommendations.

Wildlife and wildlife habitat losses associated with a reregulating dam and reservoir will be identified as a part of the feasibility study. Measures required to mitigate wildlife and/or habitat losses will be evaluated and appropriate action will be incorporated into the powerplant enlargement and reregulating reservoir plan.

Regarding the recommendations on mitigating wildlife losses from past Hungry Horse construction, we would recommend that the involved agencies meet and address the issue. In light of when the project was built, mitigation need, authority, and responsibility is in question. The recommended mitigation method of acquiring or purchasing wildlife management rights on both private and public lands has far-reaching resource management and monetary implications.

Until authority and responsibility for wildlife mitigation was determined, there would be little reason to commence with such a study as recommended.

GENERAL RECOMMENDATIONS

PROGRAM DEVELOPMENT

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3. The Council should support the development of a process that protects aquatic and wildlife resources of significant value from future hydroelectric development. This would be a form of mitigation for past development needed to establish an essential balance between rivers and reservoirs. Highest priority should go to streams that could not be adequately mitigated.

Mitigation for existing development, if not provided for in the authorizating act for that project, would appear to require legislative action. If the Northwest Power Bill provides such broad authority, thus negating the need for project-related legislation, it should be so stated. The council should take no action which would preclude the study and evaluation of a hydroelectric or other type of water resource development on a stream. It is the purpose of such studies to show alternative water uses and related cost and benefit tradeoffs both at site and cumulative. This information is then available to legislators in managing water resources in response to societal preferences.

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4. The Council should include in the fish and wildlife program a method to insure that mitigation for fish and wildlife losses is a mandatory part of the process of planning, licensing and development of projects.

Implementation of this recommendation would appear to require amendment to the Fish and Wildlife Coordination Act or a new coordination act.

Page 105

History of Wildlife Concerns, first paragraph, second sentence--"Water development projects are responsible for the loss of a large amount of riparian habitat."

This statement is somewhat misleading because of its general nature. While reservoir development in some areas causes a loss of habitat, many water development projects provide extensive wildlife habitat. Examples are Columbia Basin, Yakima, and Minidoka projects in this region which support major upland game and waterfowl populations and provide extensive hunting opportunities.

Page 107-1

Project design should include acquisition of lands (beyond those strictly essential to project operations) to aid in offsetting project-caused wildlife losses. These should be acquired at the same time as other project lands and be included in basic project costs. The construction agency should grant management easements or rights on these lands to the fish and wildlife agency responsible for the impacted resources and should also provide funding to permit development, operation, and management of the area for the expected life of the project.

This recommendation needs to distinguish between lands for mitigation and lands for enhancement. In the case of enhancement, the capital and annual costs of land acquisition would be cost shared under existing law. Also, any transfer of lands to fish and wildlife agencies would be in accordance with existing statutory requirement.

Page 108-3

Public hearings should be held to ensure that any decisions regarding acceptance or rejection of proposed recommendations to prevent or lessen project-caused impacts on wildlife are made with full public knowledge, input, and review.

Reclamation does this through the planning study formulation and workshop programs. A separate program would be duplicative and confusing to the public.

ADDITIONAL COMMENTS

Suggest adding a general recommendation that Fish and Wildlife agencies be required to identify and evaluate losses requiring mitigation to assist the action agency in formulating the most effective and cost-effective method for mitigating identified losses.

Suggest also that on existing projects that new habitat resulting from project development be compared to habitat lost, to determine the "net" loss of habitat resulting from project development that requires mitigation.

PACIFIC POWER & LIGHT COMPANY
920 S.W. SIXTH AVENUE • PORTLAND, OREGON 97204 • (503) 243-1122

October 29, 1981

Mr. Patrick Graham, Chairman
Montana Fish, Wildlife & Power
ad Hoc Committee
Region One
P. O. Box 67
Kalispell MT 59901

Dear Mr. Graham:

Pacific Power & Light Company appreciates the opportunity to participate in the preparation of Montana's Recommendations for the Fish and Wildlife Program and commends the Department for the cooperative process by which this program was developed. We regard this program as a recommendation from the State of Montana and in many respects endorse the report contents. However, we would like to address the section on General Recommendations as they pertain to hydroelectric power generation in the future and the use of existing storage reservoirs.

We recognize that the two principal storage reservoirs in Montana, Libby and Hungry Horse have multipurpose use and that part of that use is for the benefit of upstream or resident fish resources and fisheries. We believe it is appropriate to recognize the water needs for these resources in concert with the water needs for electric power, flood control and the needs for anadromous fish. A balance between uses is the logical approach.

It has been suggested that additional storage should be developed to supplement current reservoir storage for meeting the downstream water needs, particularly anadromous fish, and thereby distribute the water demand over more sources. We concur in this recommendation, but we do not have any suggestions at this time as to where such storage should be located. No doubt any new storage will incur some environmental impacts, but we believe this option should be thoroughly studied on a case by case basis to determine the overall benefits and costs.

We have no suggestions to offer concerning the state's recommendations for possible studies at Pacific Power's Big Fork hydroelectric project.

Yours sincerely,

J. A. R. Hamilton
Environmental Coordinator

JARH/ka

THE WASHINGTON WATER POWER COMPANY

P.O. BOX 3727 • SPOKANE, WASHINGTON 99220 • S[illegible]

D. L. OLSON
SENIOR VICE PRESIDENT
RESOURCES

November 3, 1981

Mr. Pat Graham
Montana Department of
Fish, Wildlife, and Parks
P. O. Box 67
Kalispell, MT 59901

Dear Mr. Graham:

The Company and Montana Department of Fish, Wildlife and Parks have a long-standing record of cooperation concerning fish resources associated with Company owned and operated hydroelectric projects on the lower Clark Fork River - the Cabinet Gorge and Noxon Rapids Projects. The Company is pleased to have had this continued opportunity to work with the Department to critically review recommendations for fish and wildlife developed for the Regional Power Act. Your efforts to consult with hydroelectric project operators in this process are very much appreciated. The comments which follow are from our review of the final document, "Montana Recommendations for Fish and Wildlife".

As the recommendations document indicates, neither the Company nor the Department have been idle in concern for the fish resources of Cabinet Gorge and Noxon Rapids Projects. Unfortunately, the many man-hours and funds expended in mitigation efforts and management to improve the cold water fishery have only had short-term benefits. It appears management efforts must be redirected toward species more suited to the available habitat if benefits of a more permanent status are to be achieved. As such, the Company supports the approach of the on-site recommendation for the lower Clark Fork River fishery. Experience indicates an assessment of aquatic habitat conditions and potential methods of improvement will be a prerequisite to successful fishery management in this river area.

The on-site wildlife recommendations are not entirely acceptable as mitigation measures. The severity of wildlife impacts caused by the lower Clark Fork River projects was, in all probability, limited. However, the Company does support the intention of on-site wildlife recommendations as enhancement measures under the provisions of the Act, as appropriate circumstances are defined.

Off-site recommendations for the lower Clark Fork River projects are not endorsed by the Company. Under the terms of the Act, it seems off-site mitigation measures are to be considered only if on-site mitigation of losses is not possible. The Company would prefer all mitigative efforts to be concentrated on a project area before any off-site mitigation is considered. Further, the Act directs development of a process whereby fish and wildlife receive "equitable treatment" in energy development decisions. This provision will account for exceptional resource values of any stream. The unqualified request for 'blanket' preservation of some waterways is therefore not supported by the Company.

Off-site recommendations as well as the goal and objective statements set forth for resource improvements both neglect to identify management targets for mitigation. Phrases such as "to establish a significant/acceptable fishery", "meet public demand" or "as partial compensation for" are not absolute. How much mitigation is required to provide compensation for any given hydroelectric caused impact remains undefined for recommendations in this document. Such targets must be agreed upon prior to implementation of any mitigation measure.

Also to be established is the priority of these Montana recommendations in comparison to other concerns for fish, wildlife and power. The Act stipulates the fish and wildlife program is to be coordinated to the greatest extent possible on a system-wide basis. There will undoubtedly be areas of conflict between the fish and wildlife recommendations which must be addressed.

General and Tribal recommendations sections of the document were developed independently of the open forum critique process to which other recommendations were subject. Recommendations for other projects in the Montana document have the potential to affect Company project operations. The Company will review these and provide comment, as appropriate, to the Regional Planning Council during the developmental phase of the fish and wildlife program.

In summary, Company representatives have worked with the Department in an advisory capacity in the development of fish and wildlife recommendations. The Company supports (1) the on-site assessment approach recommended for the lower Clark Fork River fishery and (2) the intent of on-site wildlife recommendations as enhancement measures. Off-site recommendations are not endorsed. Issues not addressed in this document include establishing quantitative or qualitative mitigation targets and coordinating these recommendations on a system-wide basis. These comments have addressed sections of the document specific to the Cabinet Gorge and Noxon Rapids Projects. Comments on other recommendations will be submitted, as appropriate, to the Regional Planning Council.

Thank you again for your cooperative efforts in this matter. The Company looks forward to continued cooperative efforts during the development of the fish and wildlife program under the Regional Power Act.

Sincerely,

D. L. Olson

D. L. Olson
Senior Vice President

DLO/rdw

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX C-3755
SEATTLE, WASHINGTON 98124

6 NOV 1981

NPSEN-PL-ER

Patrick J. Graham, Chairman
Fish and Wildlife Ad Hoc Committee
Montana Department of Fish,
Wildlife and Parks
Post Office Box 67
Kalispell, Montana 59901

Dear Mr. Graham:

I have reviewed the revision of the final draft of "Montana's Recommendations for the Fish and Wildlife Program" to be submitted to the Pacific Northwest Power and Conservation Planning Council inclosed in your letter of 23 October 1981 and additional revisions received by express mail on 4 November 1981.

I support the committee's recommendations developed for Libby Dam Project and assume that opportunity for further review of the general recommendations within our area of responsibility will be accomplished by our Division office following submittal of these recommendations to the council.

We appreciate the opportunity to comment on these recommendations. Please let us know if we can be of further assistance in their development or refinement.

Sincerely,

Dwain A. Hogan

[illegible], P.E.
Chief, Engineering Division

STATE OF OREGON - WATER RESOURCES DEPARTMENT

VICTOR ATIYEH
GOVERNOR

Water Resources Department

MILL CREEK OFFICE PARK
555 13th STREET N.E., SALEM, OREGON 97310 PHONE 378-3671

November 12, 1981

Daniel J. Evans, Chairman
Pacific Northwest Electric Power
and Conservation Planning Council
700 S.W. Taylor Street
Carriage Building
Portland, Oreg. 97205

Dear Mr. Evans:

The Water Policy Review Board would like to offer the following comments in response to the June 10, 1981 Council motion requesting recommendations on the fish and wildlife provisions of Section 4(h)(2) of the Regional Power Act.

Under Oregon Law, the Water Policy Review Board is charged with formulating coordinated plans and programs for the use, control and development of the water resources of this state. Basin programs establishing state water policy have been adopted for the major Oregon drainage basins including river systems tributary to the Columbia and Snake Rivers. These programs generally classify unappropriated waters for the highest and best uses, reserve waters for specific future use and establish minimum perennial streamflows to support aquatic life or minimize pollution. We recognize that the Regional Power Act emphasizes only fish, wildlife and power uses. The Water Policy Review Board, however, must consider and address all beneficial uses of water. Copies of the basin programs have been enclosed so that the adopted policies can be integrated in the regional planning activities.

The Board is presently in the process of identifying Oregon's water requirements from the Columbia River and its tributary basins. This information will be developed and provided to the Council within the next year.

In the area of power development, all applications for hydroelectric projects greater than 100 theoretical horsepower in Oregon are referred to the Board for public hearings. The purpose of this review is to determine if proposed projects would impair or be detrimental to the public interest. By statute, evaluation includes the potential use

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of water for all purposes, the protection of commercial and game fishing and wildlife, the maximum economic development of the waters involved and the amount of unappropriated water available. We are prepared to share data or the results of the assessment of specific projects with the Council.

It is the stated policy of the Reagan Administration to recognize state primacy and jurisdiction in water resource management and water allocation. Interior Secretary James Watt has further assured the Western Governors that every opportunity will be made to protect state rights and prerogatives in implementing federal programs and to consult with the governors and state agencies in formulating future water policies and decisions. We hope the Pacific Northwest Electric Power and Conservation Planning Council will work with the western states in a similar cooperative spirit on the Columbia River and its tributaries. We are optimistic that through cooperation and coordination potential water resource conflicts can be avoided in the implementation of the Regional Power Act.

Sincerely,

Donel J. Lane, Chairman
Water Policy Review Board

DJL:bhm

Enclosures

cc: Governor Victor Atiyeh
Roy Hemmingway
Herbert Schwab

STATE OF OREGON
WATER USE PROGRAMS

formulated by the

WATER POLICY REVIEW BOARD

DONEL J. LANE, CHAIRMAN
GEORGE H. PROCTOR, VICE CHAIRMAN
JAMES K. BELKNAP
JEAN FROST
JACK A. HOFFBUHR
ELLEN LOWE
FRANK MOORE

of the

WATER RESOURCES DEPARTMENT

JAMES E. SEXSON, DIRECTOR

January 1980

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Water Use Programs Subject to Periodic Modification

STATEMENT OF INTENT

ADOPTED BY THE WATER POLICY REVIEW BOARD

November 30, 1979

1. The Water Policy Review Board requests the opportunity to review applications for an allowed beneficial use that has traditionally been identified as non-consumptive or take-and-put, such as fish hatcheries, hydro-electric facilities, municipal or water process industries that could potentially impact, in an adverse way, the Board's minimum flow regime or the public interest.

2. The Water Policy Review Board intends to continue to protect, in its entirety, that portion of the stream system on which any minimum stream flow has been established. Permitting procedures and water use regulation should reflect that objective as far as possible under the law. The Board solicits the advice or complaints of any party who is aware that the objectives are not being met.

LEGEND

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
DOMESTIC LIVESTOCK	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	NONE	DL	DL
MUNICIPAL	M	M		M	M	M	M	M				M							M
IRRIGATION	I	I	I	I	IP	I	I		I	IP	IP		IP	IP					I
POWER	P	PP	P	PP	P			P	P	P	PP								P
INDUSTRIAL MINING	IM	IM	IM			I										I			
RECREATION WILDLIFE FISHLIFE	RWF	RWF	RWF	RWF	RWF	RWF	RWF	RWF	RWF	RWF	RWF	RWF	RWF	RWF	RWF	RWF			RWF

IP Irrigation [illegible]
PP Power [illegible]
W Order of withdrawal

NOTES

1 Willamette Basin (April 1, 1976):
Natural state
Klamath River tidal influence zone
Normal flow Basin diversions

2A [illegible] (June 1, 1964)
Natural state in Middle Fork and Willamette subbasins
South Fork Santiam River no action below Foster Dam
Lost Creek
All actions shall not apply to waters legally stored to excess of [illegible]
[illegible] existing water right
Upper Applegate
No [illegible] Applegate reservoir for municipal use

[illegible] (June 1, 1964)
[illegible] elevation

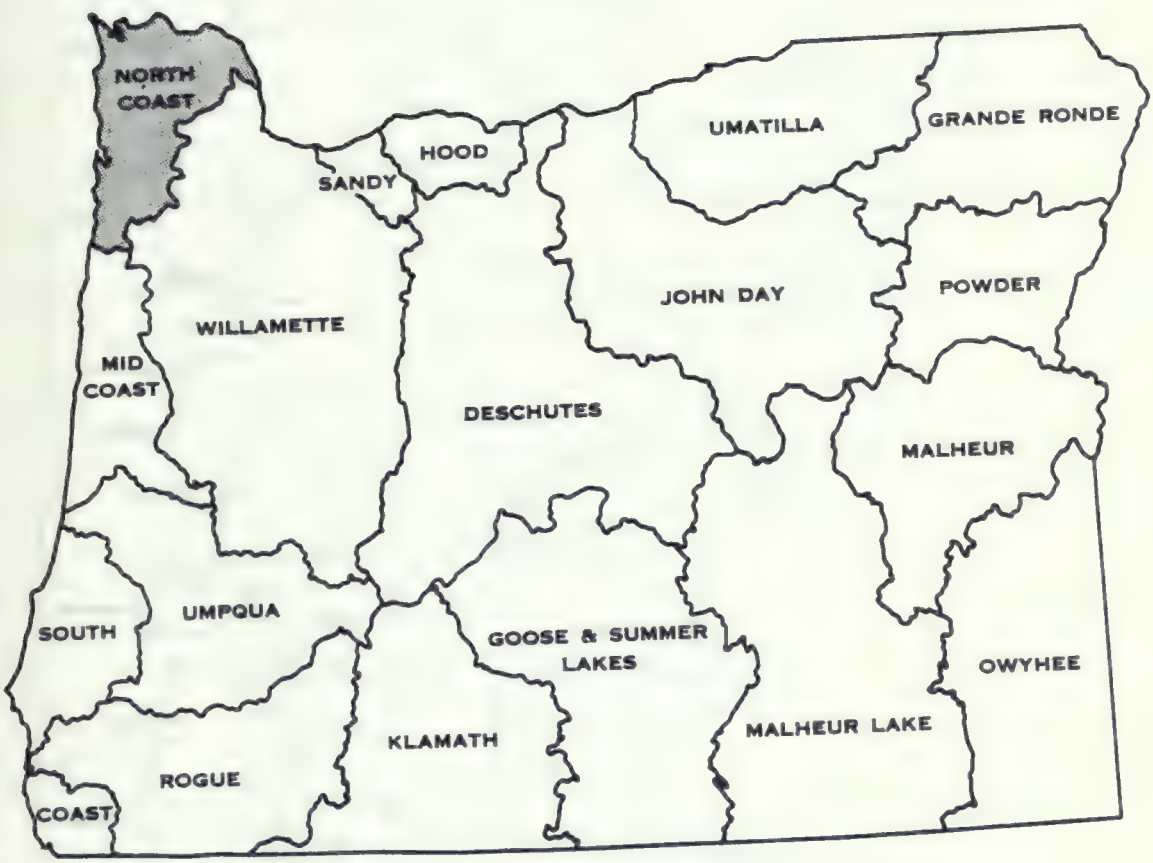
[illegible] (June 1, 1976)
[illegible] elevation and Hyatt Lake

[illegible]

[illegible]

[illegible]

NORTH COAST BASIN



WASHINGTON
COLUMBIA
ASTORIA
Hammond
Warrenton
Gearhart
Seaside
Cannon Beach
Arch Cape
Cape Falcon
Nehalem
Manzanita
Mohler
Wheeler
Brighton
Rockaway
Garibaldi
Bay City
Tillamook
Oceanside
Netarts
Cape Meares
Cape Lookout
Hemlock
Sandlake
Beaver
Blaine
Hebo
Cape Kiwanda
Pacific City
Cloverdale
Oretown
Neskowin
Cascade Head
Lincoln City
Bradwood
Knappa
Svensen
Astoria
Cathlamet
Wauna
Westport
Woodson
Clatskanie
Quincy
Mayger
Longview
Kelso
Alston
Rainier
Goble
Apiary
Mist
Birkenfeld
Jewell
Elsie
Hamlet
Vernonia
Keasey
Pittsburg
Deer Island
Columbia City
St. Helens
Scappoose
Timber
Buxton
Washburn
Oregon
Valley Jct.
Dallas
Grand Ronde
Willamina
Sheridan
Dayton
Yamhill
Carlton
Newberg
Dundee
Lafayette
McMinnville
Amity
Sheridan
Dallas
Independence
Monmouth
Falls City
Salem
Turner
Aumsville
Stayton
Sublimity
Mill City
Gates
Detroit
Idanha
Scio
Jefferson
Albany
Tangent
Shedd
Halsey
Harrisburg
Brownsville
Sweet Home
Lebanon
Crabtree
Scravel Hill
Waterloo
Lacomb
Foster
Green Peter Res.
Foster Res.
Fern Ridge Res.
Cougar Res.
Hills Creek Res.
Lookout Point Res.
Dexter Res.
Blue River Res.
Detroit Res.
Big Cliff Res.
Timber Linn Mem. Park
Willamette Mission State Park
Champoeg State Park
Butteville
Wheatland Ferry
Scotts Mills
Silverton
Mt. Angel
Gervais
Woodburn
Hubbard
Aurora
Donald
Canby
Molalla
Oregon City
Gladstone
West Linn
Lake Oswego
Tualatin
Sherwood
Wilsonville
Tigard
Beaverton
Hillsboro
Forest Grove
Cornelius
North Plains
Banks
Manning
Vernonia
Clatskanie
Rainier
Scappoose
St. Helens
Columbia City
Deer Island
Goble
Longview
Kelso
Kalama
Woodland
Ridgefield
Vancouver
Camas
Washougal
Portland
Troutdale
Gresham
Sandy
Estacada
Molalla
Silverton

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the North Coast Basin	)))))	North Coast Basin May 8, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 completed a study of the North Coast Basin as delineated on State Water Resources Board Map 1.70146;

WHEREAS results of that study have been published in the State Water Resources Board report, North Coast Basin dated June 1961;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 adopted a program dated April 3, 1964 to classify the water resources of the North Coast Basin;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 and ORS 536.340 undertook a restudy of the North Coast Basin as delineated on State Water Resources Board Map 1.6, dated 1972;

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the North Coast Basin;

WHEREAS the Water Policy Review Board under the authority of ORS 536.300 and 536.340 has undertaken a restudy of the waters of the North Coast Basin;

WHEREAS in all studies consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood plains and reservoir sites; and

WHEREAS as a result of said studies the following findings have been reached by this Board:

I. Basinwide Findings

A. There is sufficient water supply on an annual yield basis to satisfy existing and future needs.

*Modifies North Coast Basin Programs dated October 31, 1962, April 3, 1964, May 9, 1973, and April 21, 1978.

B. There is a seasonal distribution problem with insufficient water supply in many streams during the low flow months.

C. Municipal and irrigation are the major consumptive uses, and fish life is the major nonconsumptive use of water.

D. Shortages of surface water supply for irrigation occur during the late summer months.

E. Shortages of surface water supply for municipal purposes for small coastal communities occur during the late summer months.

F. In many streams during the low flow season, flows are less than minimum flows recognized as needed to sustain fish life.

G. Recommended minimum flows for fish life during August through October can be met only through augmentation of existing low flows on most streams.

H. Increasing water use is creating significant water pollution problems during the low flow months.

I. Future water supply needs will be met primarily by surface water and will require storage of winter flows. Storage sites exist throughout the basin.

J. Known ground water supplies are of limited quantity throughout most of the basin.

K. Ground water sources do supplement some municipal water supplies during low flow months.

L. Existing use of water under domestic water rights, although small relative to annual yield of the streams, is of great importance.

M. Future large scale domestic withdrawals would conflict with instream uses.

N. Water requirements for existing power development are small relative to existing streamflows.

O. Existing and potential water use for mining is small.

P. Recreation is an important factor in the economy of the basin and will increase in importance in the future. Sport fishing is presently the leading water-based recreation.

Q. Existing out-of-stream recreation water use is small relative to existing streamflows.

R. Substantial potential exists for recreation water use both out-of-stream and instream.

S. Existing wildlife water use is small.

T. Potential exists for water use to enhance waterfowl habitat.

U. The existing anadromous fish resource is of national significance.

V. Commercial fishing is important to the economy of the basin.

W. Adequate perennial streamflows are essential to the preservation of the anadromous fish resource. In many streams storage of winter flows will be necessary to provide adequate perennial streamflows.

X. Improvement of streamflow to enhance water quality would be beneficial, but utilization of streamflows to minimize man-made pollution by dilution would conflict with other beneficial uses.

Y. Localized flooding, drainage, and streambank erosion problems exist.

Z. Because of physical and economic factors, classification of certain waters for limited-purpose would be in the public interest.

II. Subbasin Findings

A. Tillamook Subbasin

1. Existing municipal water use is concentrated among the subbasin's littoral (coastal) fringe.

2. Out-of-basin diversions to the Willamette Valley for municipal purposes exist in the upper Trask and Nestucca watershed. These diversions are a small part of the average annual yield.

3. Future out-of-basin diversions could, with adequate storage, be compatible with existing and future downstream uses.

4. Future municipal water demands will be centered primarily in the Tillamook Bay area and south along the littoral (coastal) fringe.

5. Flows, in many streams which supply municipal water, are not adequate to meet existing municipal water rights during the low flow season.

6. Most existing industrial water use is centered in the Tillamook Bay area.

7. Most of the water supply for industrial use is from municpal water systems.

8. Future industrial water demands will be centered in the Tillamook Bay area and will be met primarily by municipal water systems.

9. Existing irrigation water use is concentrated in the Nestucca, Tillamook, Trask, and Wilson watersheds with lesser use in the lower portion of the Little Nestucca, Kilchis, Miami, and Sand Lake watersheds.

10. Significant amounts of potentially irrigable land exist in the Nestucca and Tillamook watersheds with lesser amounts in the lower portions of the Trask, Wilson, Kilchis, Miami, and Sand Lake watersheds.

11. Little or no potentially irrigable land exists in the Neskowin, Little Nestucca, and small coastal watersheds.

12. On most streams existing streamflows during the irrigation season would support little if any increased irrigation withdrawals if minimum perennial streamflows are to be maintained.

13. Sites for hydroelectric power development exist in the Trask, Wilson, and Nestucca Rivers.

14. Existing out-of-stream water use for fish life consists of withdrawals for fish hatcheries in the Nestucca and Trask watersheds.

15. Existing protection of minimum perennial streamflows for fish life consists of two minimum flows established one each on the Trask and Wilson Rivers.

16. Existing streamflows are not adequate during the low flow season to meet recommended minimum flows for fish life in Neskowin Creek, Little Nestucca, Tillamook, Trask, Wilson, Kilchis, and Miami Rivers.

17. Legal diversions from Neskowin Creek, Beaver Creek (tributary to Nestucca), Tillamook and Trask Rivers are nearly equal to natural streamflows during the low flow season.

B. Nehalem Subbasin

1. Existing municipal water use is concentrated in the Nehalem Bay and upper Nehalem River areas, and future demands are expected to remain centered in these areas.

2. Flows in many streams which supply municipal water are not adequate to meet existing municipal water rights during the low flow season.

3. Existing industrial water use is associated primarily with the wood products industry.

4. Industrial water demands within the next 15-20 years are not expected to be significantly greater than existing demands.

5. Existing irrigation water use is scattered, with the largest use being in the vicinity of Birkenfeld, Vernonia, and the lower Nehalem River and Nehalem Bay area.

6. Significant amounts of potentially irrigable land exist in the Nehalem Bay area, along North Fork Nehalem River, and in the middle and upper Nehalem River watersheds.

7. Little or no potentially irrigable land exists between Batterson and Lukarilla (between river mile 13 and river mile 32 on the Nehalem River) in the Nehalem watershed.

8. Sites for hydroelectric power development exist on the main stem Nehalem River.

9. Existing out-of-stream water use for fish life consists of withdrawals for fish hatchery operations in the North Fork Nehalem River watershed.

10. Existing protection of minimum perennial streamflows for fish life consists of a minimum flow established on the main stem Nehalem River.

11. Existing streamflows are not adequate during the low flow season to meet recommended minimum flows for fish life in either the North Fork Nehalem or Nehalem Rivers.

12. Between river mile 13 and river mile 32 on the Nehalem River, existing and projected out-of-stream water needs are small.

C. Columbia Subbasin

1. Existing municipal water use is centered in the Astoria-Warrenton area and to a lesser degree south along the coast and east along the Columbia River in Columbia County.

2. Future municipal water demands will result from expansion of existing urbanized areas.

3. Municipalities hold a number of sizable municipal water rights, either unused or not fully used, on Necanicum, Lewis and Clark, and Youngs Rivers, and Bear, Beaver, Big and Elk Creeks. Maximum legal diversions from Bear, Beaver and Big Creeks and Youngs River are nearly equal to existing streamflows during the flow season.

4. The Columbia River is an important municipal water supply.

5. The Columbia River has the potential for meeting future municipal water supply demands.

6. Existing industrial water use is centered in the Astoria-Warrenton area and along the Columbia River.

7. Existing industrial water demands are met primarily by municipal systems and by withdrawals from the Columbia River.

8. Future industrial water demands, within the next 15-20 years, will consist primarily of expansions of existing facilities with water supplies continuing to be obtained from municipal systems and the Columbia River.

9. Existing irrigation water use is not extensive. Most of the irrigated land is located in the Youngs River area and along the Columbia River in Columbia County.

10. Potentially irrigable lands, although mostly poor or marginal, exist in the Youngs Bay area, along the Pacific Coast, and along the Columbia River, primarily in Columbia County.

11. Few sites for hydroelectric power development exist in the subbasin.

12. Existing out-of-stream water use for fish life consists of withdrawals for fish hatchery operations on Big Creek and Klaskanine River.

13. The waters of Clatskanie and Klaskanine Rivers and their tributaries, the Lewis and Clark River, and Tillasqua Creek (Big Creek) have been withdrawn by ORS 538.251 for the protection of fish life. ORS 538.260 states that ORS 538.251 shall not affect any existing rights or prevent appropriations for domestic, stock, municipal, fish culture, esthetic, recreational, or public park purposes.

14. Existing streamflows are not adequate during the summer months to meet recommended minimum flows for fish life in Elk, Beaver, and Big Creeks; and Youngs and Necanicum Rivers.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with ORS 536.300(2) pertaining to the water resources of the North Coast Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the North Coast Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses; and the waters of the North Coast Basin are hereby so classified with the following exceptions:

1. The waters of the natural lakes of the North Coast Basin are classified only for utilization of water for domestic, livestock, power development not to exceed 7 1/2 theoretical horsepower, and in-lake uses for recreation, wildlife, and fish life purposes.

2. The attainment of the highest and best use of the waters of Clatskanie and Klaskanine Rivers and their tributaries, Lewis and Clark River and Tillasqua Creek (Big Creek), has been determined through legislative withdrawal by ORS 538.251 to be for the protection of fish life. ORS 538.260 states that ORS 538.251 shall not affect any existing rights or prevent appropriation for domestic, stock, municipal, fish culture, esthetic, recreational, or public park purposes. No classifications within this program are intended to contradict the intent of this statute.

3. The waters of the Columbia River creating a tidal influence in the mouths of the tributaries to the Columbia River within the Columbia Subbasin are classified only for utilization of water for domestic, livestock, municipal, irrigation, industrial, recreation, wildlife, and fish life purposes.

4. The waters of all streams tributary to Sand Lake are classified only for utilization for domestic, livestock, use in dairies, irrigation of lawns and noncommercial gardens not exceeding one-half acre in area, power development and instream use for recreation, fish life and wildlife purposes.

5. The waters of Jetty Creek and its tributaries are classified only for utilization of water for human consumption, livestock consumption, power development and instream uses for recreation, wildlife and fish life purposes. In addition, up to one cubic foot per second of the waters of Jetty Creek is reserved for municipal use.

6. The waters of Heitmiller Creek are classified only for utilization of water for human consumption, livestock consumption, and instream use for recreation, wildlife and fish life purposes.

7. The waters of the following streams are classified only for utilization of water for human consumption, livestock consumption, power development and instream uses for recreation, wildlife, and fish life purposes:

Tillamook Subbasin

a. All streams tributrary to Daley Lake

b. All streams tributary to Netarts Bay

c. Coleman Creek and its tributaries

d. Vaughn Creek and its tributaries

e. Douhty Creek and its tributaries

f. Patterson Creek and its tributaries

g. Larson Creek and its tributaries

h. All streams tributary to Lake Lytle

Nehalem Subbasin

a. Salmonberry River and its tributaries

b. Rock Creek and its tributaries

Columbia Subbasin

a. Short Sand Creek and its tributaries

b. Arch Cape Creek and its tributaries

c. Cullaby Creek and its tributaries

d. John Day River and its tributaries

e. Gnat Creek and its tributaries

f. All tributaries to Westport Slough, except Plympton Creek

g. Tide Creek and its tributaries

h. Goble Creek and its tributaries

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for human consumption, livestock consumption, and waters legally released from storage shall be made or granted by any state agency or public corporation of the state for the waters of the following streams and their tributaries for flows below the amounts specified:

2925A

Minimum Perennial Streamflows (cfs)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
					Tillamook Subbasin							
Neskowin Creek -- to be maintained from the confluence of Prospect Creek (NW 1/4 Section 5, Township 6 South, Range 10 West) to the mouth of Neskowin Creek												
40	90	90	90	90	90	90	60	40	20	10	10	10
Little Nestucca River -- to be maintained from the confluence of Louie Creek (SE 1/4 Section 28, Township 5 South, Range 9 West) to the confluence of the South Fork (SE 1/4 Section 25, Township 5 South, Range 10 West)												
30	90	90	90	80	80	80	80	60	10	10	10	10
Little Nestucca River -- to be maintained from the confluence of the South Fork (SE 1/4 Section 25, Township 5 South, Range 10 West) to the confluence of Fall Creek (NW 1/4 Section 15, Township 5 South, Range 9 West to the confluence of the South Fork (SE 1/4 Section 25, Township 5 South, Range 10 West)												
40	110	110	110	100	100	100	100	70	40	15	15	15
Little Nestucca River -- to be maintained from the confluence of Fall Creek NW 1/4 Section 15, Township 5 South, Range 10 West) to the mouth of Little Nestucca River												
60	130	130	130	130	130	130	130	100	60	25	25	25
Nestucca River -- to be maintained from the confluence of Elk Creek (NW 1/4 Section 27, Township 3 South, Range 7 West) to the confluence of Bible Creek (NW 1/4 Section 7, Township 4 South, Range 7 West)												
40	110	110	110	110	110	110	110	100	50	20	20	20
Nestucca River -- to be maintained from the confluence of Bible Creek (NW 1/4 Section 7, Township 4 South, Range 7 West) to the confluence of Moon Creek (SW 1/4 Section 30, Township 3 South, Range 8 West)												
80	150	180	180	180	180	180	180	180	100	60	60	60

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Moon Creek -- to be maintained in Moon Creek at or near its confluence with the Nestucca River (SW 1/4 Section 30, Township 3 South, Range 8 West)												
20	50	50	50	40	40	40	40	30	20	5	5	5
Nestucca River -- to be maintained from the confluence of Moon Creek (SW 1/4 Section 30, Township 3 South, Range 8 West) to the confluence of Beaver Creek (SE 1/4 Section 30, Township 3 South, Range 9 West)												
100	100	230	230	220	220	220	220	210	120	65	65	65
East Beaver Creek -- to be maintained in East Beaver Creek at or near its confluence with Beaver Creek (NW 1/4 Section 18, Township 3 South, Range 9 West)												
20	20	60	60	50	50	50	50	40	20	8	8	8
Beaver Creek -- to be maintained from the confluence of East Beaver Creek (NW 1/4 Section 18, Township 3 South, Range 9 West) to the confluence with the Nestucca River (SE 1/4 Section 30, Township 3 South, Range 9 West)												
40	40	80	80	75	75	75	75	60	40	15	15	15
Nestucca River -- to be maintained from the confluence of Beaver Creek (SE 1/4 Section 30, Township 3 South, Range 9 West) to the confluence of the Three Rivers (SE 1/4 Section 11, Township 4 South, Range 10 West)												
140	200	250	250	250	250	250	250	200	150	80	80	80
Three Rivers -- to be maintained from the confluence of Alder Creek (NW 1/4 Section 4, Township 5 South, Range 9 West) to the confluence of Cedar Creek (NE 1/4 Section 24, Township 4 South, Range 10 West)												
20	50	80	80	60	60	60	60	50	15	10	10	10

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Three Rivers -- to be maintained from the confluence of Cedar Creek (NE 1/4 Section 24, Township 4 South, Range 10 West) to the confluence with the Nestucca River (SE 1/4 Section 11, Township 4 South, Range 10 West)												
50	90	90	90	90	90	90	90	80	40	20	20	20
Nestucca River -- to be maintained from the confluence of Three Rivers (SE 1/4 Section 11, Township 4 South, Range 10 West) to the mouth of the Nestucca River												
190	260	260	260	260	260	260	260	260	150	90	90	90
Clear Creek -- to be maintained in Clear Creek at or near its confluence with the Nestucca River (NE 1/4 Section 28, Township 4 South, Range 10 West)												
10	20	20	20	20	20	20	20	15	10	5	5	5
Sand Creek -- to be maintained from the confluence of Jewell Creek (NW 1/4 Section 20, Township 3 South, Range 10 West) to the mouth of Sand Creek												
5	20	30	30	30	30	30	30	15	5	3	2	2
Tillamook River -- to be maintained from the confluence of Killiam Creek (SW 1/4 Section 16, Township 2 South, Range 9 West) to the confluence of Beaver Creek (NW 1/4 Section 7, Township 2 South, Range 9 West)												
30	70	80	80	60	60	60	60	50	30	15	15	15
Bewley Creek -- to be maintained in Bewley Creek at or near its confluence with the Tillamook River (SE 1/4 Section 7, Township 2 South, Range 9 West)												
2	10	15	15	15	15	15	15	10	6	2	2	2

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Tillamook River -- to be maintained from the confluence of Beaver Creek (NW 1/4 Section 7, Township 2 South, Range 9 West) to the mouth of the Tillamook River												
40	90	100	100	80	80	80	80	60	40	20	20	20
North Fork Trask River -- to be maintained from the confluence of Clear Creek (SE 1/4 Section 24, Township 1 South, Range 7 West) to the confluence of Bark Shanty Creek (NW 1/4 Section 33, Township 1 South, Range 7 West)												
40	80	80	80	80	80	80	80	60	40	15	15	15
North Fork Trask River -- to be maintained from the confluence of Bark Shanty Creek (NW 1/4 Section 33, Township 1 South, Range 7 West) to the confluence of the South Fork Trask River (NE 1/4 Section 36, Township 1 South, Range 8 West)												
60	120	150	150	140	140	140	140	120	60	25	25	25
South Fork Trask River -- to be maintained from the confluence of East Fork of South Fork Trask River (SE 1/4 Section 1, Township 2 South, Range 8 West) to the confluence with the North Fork Trask River (NE 1/4 Section 36, Township 1 South, Range 8 West)												
60	140	160	160	140	140	140	140	120	60	30	30	30
Trask River -- to be maintained from the confluence with the South Fork Trask River (NE 1/4 Section 36, Township 1 South, Range 8 West) to USGS Gage #3025 (Stream Mile 10.3) (NW 1/4, Section 31, Township 1 South, Range 8 West)												
120	200	270	270	270	270	270	270	250	120	60	60	60
Trask River -- to be maintained from USGS Gage #3025 (Stream Mile 10.3) (NW 1/4 Section 31, Township 1 South, Range 8 West) to the mouth of the Trask River												
150	220	270	270	270	270	270	270	270	150	85	85	85

	Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Wilson River -- to be maintained from the confluence of Elk Creek (SE 1/4 Section 31, Township 2 North, Range 6 West) to the confluence of the North Fork Wilson River (NE 1/4 Section 9, Township 1 North, Range 7 West)													
	25	60	80	80	70	70	70	70	40	25	10	10	10
North Fork Wilson River -- to be maintained from the confluence of Lester Creek (NE 1/4 Section 4, Township 1 North, Range 7 West) to the confluence with the Wilson River (NE 1/4 Section 9, Township 1 North, Range 7 West)													
	30	80	100	100	70	70	70	70	50	30	10	10	10
Wilson River -- to be maintained from the confluence of North Fork Wilson River (NE 1/4 Section 9, Township 1 North, Range 7 West) to the confluence of Jordan Creek (NE 1/4 Section 25, Township 1 North, Range 8 West)													
	80	120	150	150	150	150	150	150	120	80	30	30	30
Jordan Creek -- to be maintained in Jordan Creek at or near its confluence with the Wilson River (NE 1/4 Section 25, Township 1 North, Range 8 West)													
	20	40	40	40	40	40	40	40	20	20	10	10	10
Wilson River -- to be maintained from the confluence of Jordan Creek (NE 1/4 Section 25, Township 1 North, Range 8 West) to the confluence with the Little North Fork Wilson River (NW 1/4 Section 24, Township 1 South, Range 9 West)													
	80	150	200	200	200	200	200	200	150	80	60	60	60
Little North Fork Wilson River -- to be maintained from the confluence of White Creek (NE 1/4 Section 12, Township 1 South, Range 9 West) to the confluence of the Wilson River (NW 1/4 Section 24, Township 1 South, Range 9 West)													
	60	100	130	130	100	100	100	100	80	50	20	20	20

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Wilson River -- to be maintained from the confluence of Little North Fork Wilson River (NW 1/4 Section 24, Township 1 North, Range 9 West) to the mouth of the Wilson River												
100	250	300	300	300	300	300	300	250	150	80	80	80
Kilchis River -- to be maintained from the confluence of South Fork Kilchis River (NW 1/4 Section 2, Township 1 North, Range 9 West) to the confluence of the Little South Fork Kilchis River (NE 1/4 Section 33, Township 1 North, Range 9 West)												
80	100	160	160	140	140	140	140	80	40	10	10	10
Little South Fork Kilchis River -- to be maintained in Little South Fork Kilchis River at or near its confluence with the Kilchis River (NE 1/4 Section 33, Township 1 North, Range 9 West)												
15	30	50	50	50	50	50	50	30	15	5	5	5
Kilchis River -- to be maintained from the confluence of Little South Fork Kilchis River (NE 1/4 Section 33, Township 1 North, Range 9 West) to the mouth of the Kilchis River												
100	150	220	220	180	180	180	180	100	60	20	20	20
Miami River -- to be maintained from the confluence of Peterson Creek (NW 1/4 Section 2, Township 1 North, Range 10 West) to the confluence of Moss Creek (SE 1/4 Section 14, Township 1 North, Range 10 West)												
40	80	100	100	80	80	80	80	40	20	8	8	8
Miami River -- to be maintained from the confluence of Moss Creek (SE 1/4 Section 14, Township 1 North, Range 10 West) to the mouth of the Miami River												
60	100	130	130	100	100	100	100	60	30	10	10	10

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept

Nehalem Subbasin

Jetty Creek -- to be maintained in Jetty Creek from WRD gage 30125 (NW 1/4 Section 16, Township 2 North, Range 10 West) to the mouth of Jetty Creek (SE 1/4 Section 17, Township 2 North, Range 10 West)

2	5	5	5	5	5	5	1/2	1/2	1/2	1/2	1/2	1/2

Nehalem River -- to be maintained from the confluence of Robinson Creek (SE 1/4, Section 3, Township 3 North, Range 5 West) to the confluence of Rock Creek (SW 1/4, Section 4, Township 4 North, Range 4 West)

20	40	40	40	30	30	30	30	20	10	5	5	5

Rock Creek -- to be maintained from the confluence of Ivy Creek (NE 1/4 Section 33, Township 5 North, Range 5 West) to the confluence with the Nehalem River (SW 1/4 Section 4, Township 4 North; Range 4 West)

30	90	90	90	80	80	80	80	50	25	12	10	10

Nehalem River -- to be maintained from the confluence of Rock Creek (SW 1/4 Section 4, Township 4 North, Range 4 West) to the confluence of Deep Creek (NE 1/4 Section 30, Township 6 North, Range 5 West)

80	120	120	120	120	120	120	120	80	40	20	20	20

Nehalem River -- to be maintained from the confluence of Deep Creek (NE 1/4 Section 30, Township 6 North, Range 5 West) to the confluence of Walker Creek (NW 1/4 Section 12, Township 5 North, Range 7 West)

100	140	160	160	160	160	160	160	110	50	30	30	30

Walker Creek -- to be maintained from the confluence of Fishhawk Creek (NW 1/4, Section 12, Township 5 North, Range 7 West) to the confluence with the Nehalem River (NW 1/4 Section 12, Township 5 North, Range 7 West)

40	120	140	140	120	120	120	120	80	40	15	15	15

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Nehalem River -- to be maintained from the confluence of Walker Creek (NW 1/4 Section 12, Township 5 North, Range 7 West) to the confluence of Humbug Creek (NW 1/4 Section 8, Township 4 North, Range 7 West)												
100	180	200	200	200	200	200	200	150	100	50	50	50
Humbug Creek -- to be maintained from the confluence of Big Creek (SE 1/4 Section 36, Township 5 North, Range 8 West) to the confluence with the Nehalem River (NW 1/4 Section 8, Township 4 North, Range 7 West)												
25	95	95	95	80	80	80	80	50	25	10	10	10
Nehalem River -- to be maintained from the confluence of Humbug Creek (NW 1/4 Section 8, Township 4 North, Range 7 West) to the confluence of the Salmonberry River (SW 1/4 Section 10, Township 3 North, Range 8 West)												
150	200	250	250	250	250	250	250	200	130	70	70	70
Salmonberry River -- to be maintained from the confluence of Belfort Creek (SE 1/4 Section 18, Township 3 North, Range 7 West) to the confluence with the Nehalem River (SW 1/4 Section 10, Township 3 North, Range 8 West)												
30	70	70	70	70	70	70	70	50	40	25	20	20
Nehalem River -- to be maintained from the confluence of Salmonberry River (SW 1/4 Section 10, Township 3 North, Range 8 West) to the confluence of Cook Creek (SW 1/4 Section 35, Township 3 North, Range 9 West)												
200	270	270	270	270	270	270	270	200	150	90	90	90
Cook Creek -- to be maintained from the confluence of Harliss Creek (NE 1/4 Section 1, Township 2 North, Range 9 West) to the confluence with the Nehalem River (SW 1/4 Section 25, Township 3 North, Range 9 West)												
30	50	50	50	50	50	50	50	30	20	10	10	10

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Nehalem River -- to be maintained from the confluence of Cook Creek (SW 1/4 Section 35, Township 3 North, Range 9 West) to the mouth of the Nehalem River)												
200	270	270	270	270	270	270	270	200	150	100	100	100
Foley Creek -- to be maintained from the confluence of East Foley Creek (NW 1/4 Section 7, Township 2 North, Range 9 West) to the confluence with the Nehalem River (SE 1/4 Section 36, Township 3 North, Range 10 West)												
10	50	60	60	50	50	50	50	30	20	5	5	5
North Fork Nehalem River -- to be maintained from the confluence of Little North Fork of North Fork Nehalem River (SW 1/4 Section 5, Township 4 North, Range 8 West) to the confluence of Soapstone Creek (SW 1/4 Section 22, Township 4 North, Range 9 West)												
20	20	70	70	70	70	70	70	40	20	10	10	10
North Fork Nehalem River -- to be maintained from the confluence of Soapstone Creek (SW 1/4 Section 22, Township 4 North, Range 9 West) to the confluence with the Nehalem River (NW 1/4 Section 23, Township 3 North, Range 10 West)												
50	140	140	140	130	130	130	130	80	50	20	20	20
Columbia Subbasin												
Elk Creek -- to be maintained from the confluence of West Fork Elk Creek (SW 1/4 Section 28, Township 5 North, Range 10 West) to the mouth of Elk Creek												
15	60	60	70	70	70	70	60	30	15	5	5	5
Necanicum River -- to be maintained from the confluence of Bergsvik Creek (SE 1/4 Section 23, Township 5 North, Range 9 West) to the confluence of Klootchie Creek (SE 1/4 Section 14, Township 5 North, Range 10 West)												
10	30	30	30	30	30	30	30	20	10	5	5	5

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
South Fork Necanicum River -- to be maintained in South Fork Necanicum River at or near its confluence with the Necanicum River (SW 1/4 Section 19, Township 5 Norh, Range 9 West)												
10	40	50	50	50	50	50	50	40	20	5	5	5
Necanicum River -- to be maintained from the confluence of Klootchie Creek (SE 1/4 Section 14, Township 5 North, Range 10 West) to the mouth of the Necanicum River												
20	80	80	80	80	80	80	80	50	30	20	10	10
Lewis and Clark River -- to be maintained from the confluence of Klickitot Creek (NW 1/4 Section 31, Township 7 North, Range 9 West) to the mouth of the Lewis and Clark River												
30	80	80	80	80	80	80	80	60	30	10	10	10
Youngs River -- to be maintained from the confluence of Wawa Creek (SE 1/4 Section 27, Township 7 North, Range 9 West) to the confluence of the Klaskanine River (NE 1/4 Section 15, Township 7 North, Range 9 West)												
20	100	120	120	120	120	120	90	40	20	10	10	10
North Fork Klaskanine River -- to be maintained in North Fork Klaskanine River at or near its confluence with the South Fork Klaskanine River (NW 1/4 Section 13, Township 7 North, Range 9 West)												
30	50	50	50	50	50	50	50	30	12	5	5	5
South Fork Klaskanine River -- to be maintained in South Fork Klaskanine River at or near its confluence with the North Fork Klaskanine River (NW 1/4 Section 13, Township 7 North, Range 9 West)												
40	70	70	70	70	70	70	70	40	15	5	5	5

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Bear Creek -- to be maintained from the confluence of Little Bear Creek (NW 1/4 Section 27, Township 8 North, Range 8 West) to the mouth of Bear Creek												
10	10	20	20	20	20	20	20	10	5	3	3	3
Big Creek -- to be maintained from the confluence of Mill Creek (SW 1/4 Section 29, Township 8 North, Range 7 West) to the mouth of Big Creek												
20	50	80	80	80	80	80	80	50	30	15	15	15
Plympton Creek -- to be maintained in Plympton Creek at or near its mouth (NW 1/4 Section 36, Township 8 North, Range 6 West)												
5	20	20	20	20	20	20	20	10	5	5	3	3
Clatskanie River -- to be maintained from the confluence of Carcus Creek (SW 1/4 Section 32, Township 7 North, Range 3 West) to the confluence of Perkins Creek (SW 1/4 Section 15, Township 7 North, Range 4 West)												
10	30	30	30	30	30	30	30	15	10	4	4	4
Clatskanie River -- to be maintained from the confluence of Perkins Creek (SW 1/4 Section 15, Township 7 North, Range 4 West) to the mouth of Clatskanie River												
20	80	80	80	80	80	80	80	40	20	10	10	10
Beaver Creek -- to be maintained from Beaver Falls (SE 1/4 Section 12, Township 7 North, Range 4 West) to the mouth of Beaver Creek												
5	10	30	50	50	50	50	50	20	10	5	5	5

C. All applications for appropriation of water for storage in structures impounding more than 3,000,000 gallons of water shall be reviewed by the Water Policy Review Board prior to approval. During the review the Water Policy Review Board may establish additional minimum flows on the natural flow of the stream to support aquatic life or minimize pollution.

D. To support present and proposed North Coast Basin water resource development no out-of-basin appropriation of the waters of the North Coast Basin shall be made or granted by any state agency or public corporation of the state without the prior approval of, and following a public hearing by, the Water Policy Review Board.

E. Applications for the use of the waters of the North Coast Basin shall not be accepted by any state agency for any purposes contrary to the classifications herein specified, and the granting of applications for such other purposes is declared to be prejudicial to the public interest, and the granting of applications for such other uses would be contrary to this water use program.

F. Rights to use of water grant by any state agency in accordance with this water use program shall be issued only on the condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

G. Structures or works for utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310; and any such structures or works, which do not give cognizance to the multiple-purpose concept, are further declared to be prejudicial to the public interest.

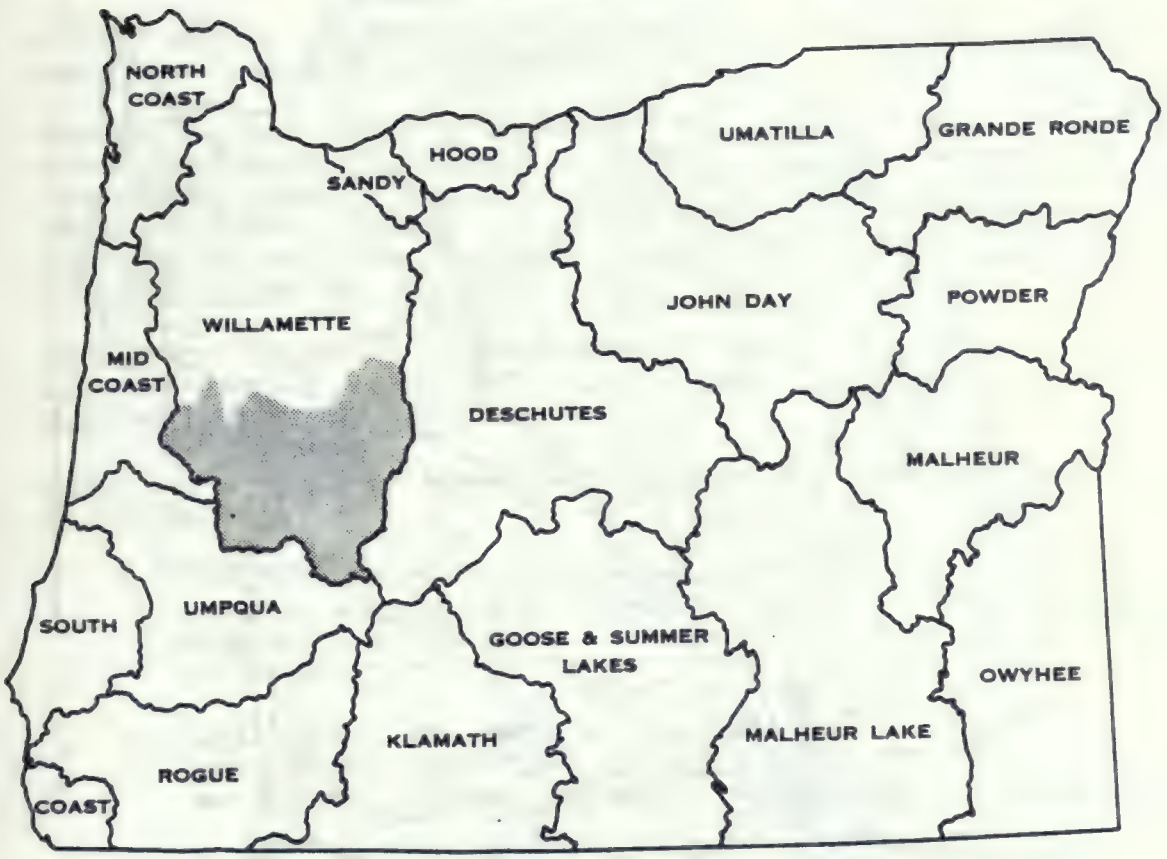
Done and dated this 8th day of May, 1981.

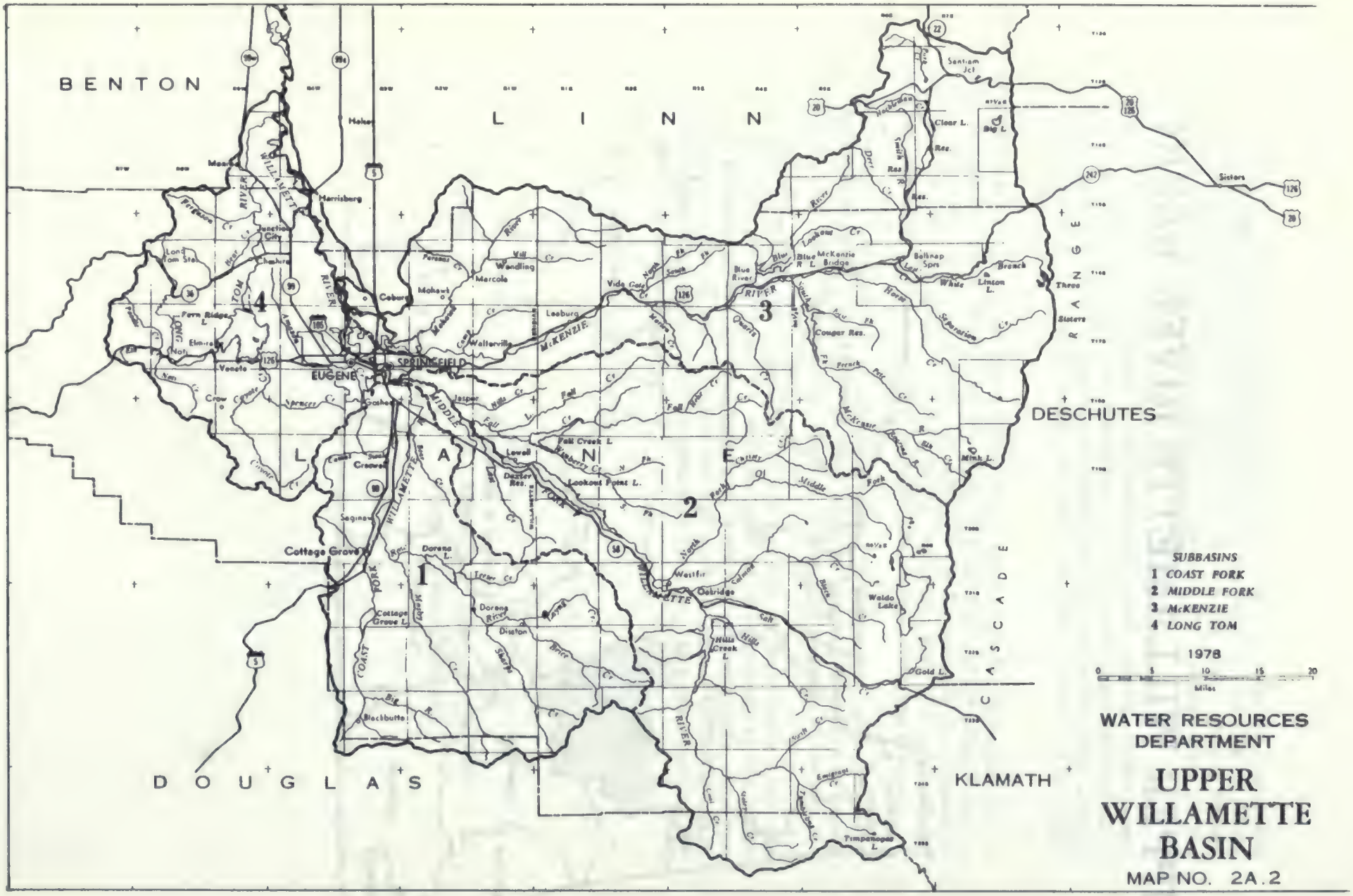
WATER POLICY REVIEW BOARD

By _____
Donel J. Lane, Chairman

2925A

UPPER WILLAMETTE RIVER BASIN




BENTON
LINN
DESCHUTES
DOUGLAS
KLAMATH
SPRINGFIELD
EUGENE
Cottage Grove
Harrisburg
Sweet Home
Sisters
Santiam Jct
Detroit
Westfir
Oakridge
Waldo Lake
Gold L.
Clear L.
Big L.
Blue River
McKenzie Bridge
Belknap Spgs.
Walterville
Leaburg
Lowell
Dexter Res.
Lookout Point L.
Fall Creek L.
Cottage Grove L.
Dorena L.
Hills Creek L.
Cougar Res.
Trimpanogas L.
Mink L.
Linton L.
Three Sisters
Mt. Washington
Mt. Jefferson
Cascade Range
Willamette River
McKenzie River
Middle Fork
Coast Fork
Row River
Long Tom River
Calapooia River
Santiam River
Blue River
Quartz Cr.
Fall Cr.
Lost Cr.
Salt Cr.
Hills Cr.
Dorena Res.
Fern Ridge L.
1
2
3
4
SUBBASINS
1 COAST FORK
2 MIDDLE FORK
3 McKENZIE
4 LONG TOM
1978
0 5 10 15 20
Miles
WATER RESOURCES DEPARTMENT
UPPER WILLAMETTE BASIN
MAP NO. 2A.2

BEFORE THE STATE WATER RESOURCES BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Upper Willamette River Basin	Upper Willamette River Basin November 10, 1980*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Upper Willamette River Basin;

WHEREAS results of this study have been published in State Water Resources Board Report, Upper Willamette Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under ORS 536.300 and 536.340 has undertaken further studies of the development of the water resources of the Upper Willamette River Basin; and

WHEREAS as a result of these studies the following findings have been reached by this Board:

1. The total quantity of water is sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of the utilization of water to minimize pollution.

2. Total yields are adequate in average years but geographical and seasonal maldistribution will result in water shortages in some areas where reliance is placed on natural streamflow.

3. Seasonal maldistribution of supply has been reduced in part by storage on major streams. Under construction, authorized, and recommended storage projects will further improve low flow conditions.

4. On most of the main streams of the basin supplies are adequate to meet existing rights. On small streams, particularly those originating in the Coast Range and parts of the lower Cascades, summer flows are not adequate to meet all existing rights simultaneously.

*Modifies Upper Willamette Basin Program dated June 22, 1964.

5. Ground water supplies are available in varying quantities throughout the basin.

6. There are large quantities of unappropriated water which come under the jurisdiction of the State Water Resources Board, but precise quantities are undetermined.

7. There is need to adjudicate the waters of the Upper Willamette River Basin to determine existing rights.

8. Rural domestic water supplies come mainly from ground water sources. Many of the supplies are taken from low-yield aquifers and seasonal shortages are not uncommon.

9. Surface and ground water sources supplying municipal needs are adequate for existing and presently foreseeable needs.

10. Inadequate precipitation during the growing season results in a need for irrigation for most crops producing a high value per acre.

11. About 40 percent of the land holding irrigation rights was irrigated in 1950.

12. Contracts have been completed for use of stored water for irrigation from Corps of Engineers reservoirs to serve less than one percent of the irrigable land in the basin.

13. The expansion of irrigation from minor tributaries may require storage development within those areas.

14. Approximately one-third of the irrigable acreage is considered economically feasible of irrigation in the foreseeable future.

15. Water stored in existing and contemplated Corps of Engineers reservoirs will be adequate to supply anticipated irrigation needs for the major acreage in the basin.

16. Power development is presently an important use of water in the basin.

17. Major potential for additional power use is on the McKenzie River but development on the main stem of this stream would conflict with fish life and recreation uses.

18. The economic merit of additional power development in the basin has not been fully established.

19. There is substantial potential for industrial development in the basin particularly in the wood products and food processing industries.

20. Water supplies for these relatively major water-using industries are considered adequate.

21. It is anticipated that water for most potential minor water-using industries will be supplied from municipal sources.

22. Mining is not at present a significant use of water.

23. Present knowledge of mineral resources does not indicate major mining use of water in the foreseeable future.

24. Water-based recreation is a major economic and social value to the basin and to the state.

25. Recreation requirements for water are large and will continue to grow, probably at an accelerated rate.

26. Recreation requirements are mainly nonconsumptive in nature.

27. Recreation will conflict with other uses of water as development occurs.

28. Irrigation and power are authorized uses of water stored in Corps of Engineers reservoirs but recreation is permitted subject to the ultimate requirements of authorized purposes.

29. Reservoir recreation values cannot be maximized when project waters are released from storage for authorized downstream purposes.

30. Supplemental supplies will be needed to maximize recreation values.

31. The McKenzie River is superior as a natural recreation attraction.

32. The highest value of the natural lakes of the high Cascades is for existing and future recreation use.

33. Water consumption by wildlife does not represent a significant quantity.

34. The basin has a valuable fishery resource composed of anadromous species, resident trout, and warm-water game fish.

35. The basin has potential for enhancement of its fishery resource. Realization of this potential will require improvements in low flow conditions and water quality.

36. Important streams and stream sections in the basin do not have sufficient flow in periods of low as well as critical flow to sustain minimum levels for nonconsumptive uses of fish life and recreation.

37. Maximum enhancement of the anadromous fishery potential will require improvement in fish passage and water quality in the lower Willamette River downstream of this basin.

38. Streams in the basin with little or no regulation cannot provide the desirable base flows for fish life recommended by the fisheries agencies.

39. Pollution abatement is a major problem in some areas.

40. Contamination of ground water supplies is a problem in some areas.

41. Industrial, commercial, agricultural, and population growth will add to the existing pollution problems.

42. The growth of additional urban fringe areas with improperly developed water supply and sewerage facilities will result in continuing or expanding pollution problems.

43. Some of the smaller streams and sections of major streams are unfit for some recreation uses because of pollution.

44. Continuing control of pollution must be maintained in order to protect the quality of water.

45. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

46. Drainage is a problem, particularly on lands subject to periodic flooding.

47. Erosion is a problem in the basin. Bank erosion, due to prolonged high water stages resulting from releases of impounded flood waters, is a significant type.

48. Additional flood control storage will aggravate the bank erosion problem by extending the period of high discharge.

49. Flood control is a matter of major concern in the basin.

50. Substantial accomplishments have been made in flood damage reduction by flood control storage reservoirs.

51. Additional projects have been authorized and others recommended to further reduce flood damage.

52. Developments of many types are encroaching on the flood plain increasing damage potential and hazard to life.

53. Flood damage reduction by storage will have to be supplemented in the foreseeable future by other types of physical works, flood plain zoning, and floodproofing to provide the most economic solution to the remianing flood problem.

54. Major augmentation of the water resources in periods of need must come through storage of surplus runoff.

55. It is imperative that single-purpose development of available storage sites does not preclude full utilization of the resource.

56. Criteria for determination of desirable base flows commensurate with all beneficial uses of water have not been developed.

57. The results of the Upper Willamette River Basin study do not show any need for change or modification in the program adopted by the State Water Resources Board for the Upper McKenzie River, April 3, 1964.

58. Physical features, degree of economic development, and water-use requirements vary from subbasin to subbasin.

NOW THEREFORE BE IT RESOLVED that for the reason of variance in physical features, degree of economic development, and water-use requirements from subbasin to subbasin, the board adopts the following findings and issues program statements for each of the subbasins of the Upper Willamette River Basin.

WILLAMETTE COAST FORK

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Willamette Coast Fork Basin as delineated on State Water Resources Board Map, File No. 2A.7014;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under ORS 536.300 and 536.340 has undertaken further studies of the development of the water resources of the Upper Willamette River Basin; and

WHEREAS as a result of these studies the following findings have been reached by this board:

1. The total quantity of water is sufficient on an average year basis to satisty all existing and contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. There is enough water on a critical year basis to meet existing and contemplated consumptive needs.

3. Maldistribution exists with regard to physical location and with respect to availability during time of need.

4. Ground water occurs in varying quantities throughout the basin.

5. The storage capacity or recharge rate of ground water aquifers has not been established.

6. Ground water is the major source for domestic needs.

7. Ground water supply is generally adequate for existing domestic and irrigation rights.

8. There is need to insure water for domestic, livestock, municipal, and wildlife uses which, while small, are of benefit to the state.

9. Potential exists for substantial expansion of irrigated lands.

10. Some potential exists for at-site power development.

11. Potential for expanded industrial use of water within this basin does not appear large.

12. Potential exists for expansion of mining uses but development is not expected to be great in the foreseeable future.

13. The basin has potential for expanded recreation use of water.

14. Improvement of water quality could enhance recreation potential, particularly on the main stem.

15. Full development of the fishery potential of the basin cannot be achieved without the improvement of low flow conditions.

16. The minimum perennial streamflows that can be established on the basis of existing rights and priorities are substantially lower on some streams than the flows recommended by the fisheries interests.

17. Desirable base flows for fish life cannot be realized unless additional water can be made available from storage.

18. Maintenance of minimum perennial streamflows would be in the public interest.

19. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

20. Drainage problems exist but are not present or contemplated significant factors in water use.

21. Existing flood control reserviors have materially reduced flood damages in the basin.

22. There are physically feasible storage sites in the basin. Certain storage sites are essential to the control of floods.

23. Development of additional storage, channel improvement, and land use regulations would reduce flood hazards.

24. Storage to the extent of complete elimination of flood damage is not economically feasible.

25. Certain river sections and numerous minor streams, creeks, and lakes are by nature of their physiography, location, land ownership, or economic potential available only for limited resource needs.

26. Establishment of restrictions on further appropriations on some streams would prevent an increase in depletion potential and aid in maintaining minimum flows.

27. The maximum beneficial uses of the waters of the Willamette Coast Fork Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with ORS 536.300 (2) pertaining to the water resources of the Willamette Coast Fork Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Willamette Coast Fork Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses and the waters of the Willamette Coast Fork Basin are hereby so classified with the following exception:

> The maximum economic development of this state, the attainment of the highest and best use of the waters of the Layng Creek Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation of lawn or non-commercial garden not to exceed one-half acre in area, power development, recreation, wildlife, and fish life uses and the waters of Layng Creek Basin are hereby so classified. Diversions of the waters of Layng Creek and tributaries from the Layng Creek Basin shall be permitted for municipal use only.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, and of attaining the highest and best use of waters released from storage, no appropriations of water except for domestic or livestock uses or waters to be legally stored or legally released from storage, shall be made or granted by any state agency or public corporation of the state for the waters of:

1. The Willamette Coast Fork or its tributaries above the Willamette Coast Fork - Row River confluence for natural flows of the Willamette Coast Fork below 15 cubic feet per second, plus waters released from storage of up to 100 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

2. Row River or its tributaries above the Row River - Willamette Coast Fork confluence for natural flows of the Row River below 40 cubic feet per second, plus waters released from storage of up to 150 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

3. The Willamette Coast Fork or its tributaries above the Willamette Coast Fork - Willamette Middle Fork confluence for natural flows of the Willamette Coast Fork below 40 cubic feet per second, plus waters released from storage of up to 250 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

C. Applications for the use of the waters of the Willamette Coast Fork Basin shall not be accepted by any state agency for any other use and the granting of applications for such other uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

WILLAMETTE MIDDLE FORK

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Willamette Middle Fork Basin as delineated on State Water Resources Board Map, File No. 2A.7014;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under ORS 536.300 and 536.340 has undertaken further studies of the development of the water resources of the Upper Willamette River Basin; and

WHEREAS as a result of these studies the following findings have been reached by this board:

1. The total quantity of water is sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. There is enough water on a critical year basis to meet existing and contemplated consumptive needs and minimum nonconsumptive public uses.

3. Many streams in the basin do not provide enough flow for nonconsumptive public uses at present in periods of relatively low as well as critical flow.

4. Flows, unless augmented by storage, would not be sufficient on many streams during the summer months of critically low flow years to supply future consumptive and nonconsumptive demands.

5. Maldistribution exists with regard to physical location and with respect to availability during time of need.

6. Ground water occurs in varying quantities throughout the basin. It is concentrated in economic quantities only in alluvial deposits in the valley lowlands.

7. The storage capacity or recharge rate of ground water aquifers has not been established.

8. Ground water supplies are adequate for existing rights.

9. There is need to insure water for domestic, livestock, municipal, and wildlife uses which, while small, are of benefit to the state.

10. Extensive expansion of irrigation is not expected in this basin. The net irrigable area will undoubtedly be reduced by lands utilized for roads, urban areas, and industry.

11. Current economics appear to justify the development of the additional power generating potential within the basin. Power development could conflict with other beneficial uses of the waters especially recreation and fish life.

12. There is potential for expanded industrial use of water within this basin.

13. Mining will not be a significant factor in water utilization in the foreseeable future.

14. Recreation use of the waters of the basin has been increasing and greater water-based recreation use can be expected in the future.

15. The natural lakes of the Willamette Middle Fork Basin have a high recreation potential.

16. Anadromous fishery potential is limited by Dexter Dam to the lower Willamette Middle Fork and the Fall Creek system.

17. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

18. Drainage and reclamation of drained lands are not present and contemplated significant factors in water use.

19. Bank erosion resulting from near bankfull reservoir releases is a major problem.

20. Reservoirs completed, under construction, and authorized will control effectively all historical floods in the Willamette Middle Fork Basin.

21. Maintenance of minimum perennial streamflows would be in the public interest.

22. Establishment of restrictions on further appropriations on some streams would prevent an increase in depletion potential and aid in maintaining minimum flows.

23. Certain river sections and numerous minor streams, creeks, and lakes are by nature of their physiography, location, land

is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

WILLAMETTE-McKENZIE RIVER

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Willamette-McKenzie River Basin as delineated on State Water Resources Board Map, File No. 2A.7014;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under ORS 536.300 and 536.340 has undertaken further studies of the development of the water resources of the Upper Willamette River Basin; and

WHEREAS as a result of these studies the following findings have been reached by this board:

1. The total quantity of water is sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. Several streams in the basin do not provide enough water for consumptive requirements during low flow periods or seasonal shortage.

3. Maldistribution exists with regard to physical location and with respect to availability during time of need.

4. Ground water occurs in varying quantities throughout the basin but the quantitative amounts available for developement have not been determined.

5. Ground water supply is generally adequate for existing domestic, municipal, and irrigation rights.

6. There is need to insure water for domestic, livestock, and wildlife uses which, while small, are of benefit to the state.

7. Municipal requirements represent a significant factor in water utilization of the basin.

8. Water supplies are adequate to meet municipal needs in the foreseeable future.

9. Unused surface water rights for out-of-basin irrigation represent a material depletion potential of the waters of the basin.

10. Irrigable land along the lower McKenzie River is being withdrawn from agriculture at a rapid rate.

11. Irrigation water demands will not exceed existing supplies.

12. Natural streamflow of the Mohawk River and Camp Creek is inadequate to support an increase in irrigation.

13. There are physically feasible storage sites existing on the Mohawk River and Camp Creek which could be utilized to irrigate additional lands.

14. There is substantial power potential within the basin.

15. Potential power development would cause conflicts with recreation and fish life uses.

16. The State Water Resources Board Program, April 3, 1964, precludes utilization of the waters of the McKenzie River above Middle Falls for power purposes.

17. There is substantial potential for industrial development in the basin particularly in the wood products and food processing industries.

18. Water supplies for these relatively major water-using industries are considered adequate.

19. There are no existing water rights for mining operations in the basin. Potential for such use of water appears to be minor.

20. Water-based recreation is a major use of water and an important factor in the economy of the basin.

21. The basin has potential for expanded recreation use of water.

22. The McKenzie River is superior as a natural recreation attraction.

23. There are potential water uses on the McKenzie main stem that could have substantial adverse impact on recreation values.

24. Recreation use in the basin is increasing. Greater use can be expected in the future.

25. The McKenzie River system supports an extensive trout population and is a major spawning area for spring chinook in the Willamette River system.

26. Game fish are important to recreation use in the basin and problems affecting fish life have a direct bearing on recreation use, existing and potential.

27. Development of the fishery potential of the Mohawk River requires improvement of water supply and quality.

28. Attainment of flows recommended by the fisheries interests will be achieved only through storage.

29. Maintenance of minimum perennial streamflows would be in the public interest.

30. Utilization of flows to minimize pollution should not be permitted if such uses limits or conflicts with the multiple-purpose concept.

31. Drainage problems occur in almost all agricultural areas.

32. The basin experiences major flood damage.

33. Flood damage reduction by storage will have to be supplemented in the foreseeable future by other types of physical works, flood plain zoning, and floodproofing to provide the most economic solutions to the remaining flood problem.

34. There are physically feasible storage sites within the basin.

35. Construction of flood control and power reservoirs could provide opportunities for reservoir-type recreation.

36 Certain river sections and numerous minor streams, creeks, and lakes are by nature of their physiography, location, land ownership, or economic potential available only for limited resource needs.

37. Establishment of restrictions on further appropriations on some streams would prevent an increase in depletion potential and aid in maintaining minimum flows.

38. The results of the Upper Willamette Basin study do not show any need for change or modification of the program adopted by the State Water Resources Board for the Upper McKenzie River, April 3, 1964.

39. The maximum beneficial use of the waters of the Willamette-McKenzie River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with ORS 536.300 (2) pertaining to the water resources of the Willamette-McKenzie River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Willamette-McKenzie River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses and the waters of the Willamette-McKenzie River Basin are hereby so classified with the following exceptions:

1. The McKenzie drainage above the Linn-Lane County line is covered by the Upper McKenzie River Basin program, April 3, 1964, and is hereby adopted as a part of the Upper Willamette Basin program.

2. The maximum economic development of this state, the attainment of the highest and best use of the waters of all natural lakes of the Willamette-McKenzie River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, recreation, wildlife, and fish life uses and the waters of all natural lakes of the Willamette-McKenzie River are hereby so classified.

3. The power potential of the South Fork McKenzie River, from near its confluence with the McKenzie River upstream to Cougar Dam, should be utilized.

4. The maximum economic development of this state, the attainment of the highest and best use of the waters of the McKenzie River mainstem from its mouth to the Linn-Lane County Line, with the aforementioned exceptions, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development not to exceed 7 1/2 theoretical horsepower, recreation, wildlife, and fish life uses and the waters of the McKenzie River mainstem from its mouth to Linn-Lane County line are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, and of attaining the highest and best use of waters released from storage no appropriations of water except for domestic or livestock uses or waters to be legally stored or legally released from storage shall be made or granted by any state agency or public corporation of the state for the waters of:

1. The South Fork McKenzie River or its tributaries above the South Fork McKenzie River - McKenzie River confluence for natural flows of the South Fork McKenzie River below 200 cubic feet per second, plus waters released from storage of up to 230 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

2. Blue River or its tributaries above the Blue River - McKenzie River confluence for natural flows of Blue River below 30 cubic feet per second, plus waters released from storage of up to 350 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

3. The McKenzie River or its tributaries above U.S.G.S. - State Engineer Gage No. 14-1625 (NE 1/4 Section 5, Township 17 S., Range 3 E.) near Vida, Oregon for natural flows of the McKenzie River below 1,400 cubic feet per second plus waters released from storage of up to 580 cubic feet per second measured at the aforementioned gage.

4. Gate Creek or its tributaries above the Gate Creek - McKenzie River confluence for flows of Gate Creek below 20 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

5. Mohawk River or its tributaries above the Mohawk River - McKenzie River confluence for flows of the Mohawk River below 20 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

6. The McKenzie River or its tributaries above the intersection of the McKenzie River and Interstate Highway 5 for natural flows of the McKenzie River below 1,025 cubic feet per second, plus waters released from storage of up to 700 cubic feet per second, measured at the intersection of the McKenzie River and Interstate Highway 5.

C. Applications for the use of the waters of the Willamette-McKenzie River Basin shall not be accepted by any state agency for any other use and the granting of applications for such other uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

WILLAMETTE RIVER MAIN STEM

AND

LONG TOM RIVER

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Willamette River Main Stem and Long Tom River as delineated on State Water Resources Board Map, File No. 2A.7014;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under ORS 536.300 and 536.340 has undertaken further studies of the development of the water resources of the Upper Willamette River Basin; and

WHEREAS as a result of these studies the following findings have been reached by this board:

1. The total quantity of water is sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. Any significant expansion of consumptive use will intensify shortages during low flow periods of the summer months.

3. Flows, unless augmented by storage, will not be sufficient on most streams during the summer months of low flow years to supply future consumptive and nonconsumptive demands.

4. Maldistribution exists with regard to physical location and with respect to availability during time of need.

5. Ground water occurs in varying quantities throughout the basin. It is concentrated in economic quantities only in alluvial deposits in the valley lowlands.

6. Ground water supplies are inadequate in some areas to satisfy existing rights.

7. Ground water supplies a major portion of domestic water utilized in the basin.

8. Major municipal water supplies are obtained from sources outside this basin.

9. Existing sources of municipal water for cities obtaining water supplies in the basin appear to be adequate.

10. There is need to insure water for domestic, livestock, and municipal uses which, while small, are of benefit to the state.

11. Irrigation is an authorized use of water stored in Fern Ridge Reservoir.

12. Adequately irrigated agricultural lands represent only a small percentage of the total potentially irrigable area.

13. Storage of winter runoff from additional reservoirs, releases from constructed, under construction, authorized, and recommended reservoirs; and ground water could provide sufficient quantities to satisfy future irrigation needs.

14. There is some power potential in the basin.

15. Industrial use will be a major factor in the economy of the basin.

16. There are no water rights for mining purposes. No significant use is anticipated in the foreseeable future.

17. Recreation is a significant use of water.

18. Major recreation use of water occurs at Fern Ridge Reservoir.

19. Recreation, which is not an authorized use of Fern Ridge Reservoir, is subject to the ultimate requirements of the authorized purposes.

20. Releases from upstream storage to replace waters withdrawn from Fern Ridge Reservoir for authorized purposes could materially assist in maintaining recreation values.

21. Water consumption by wildlife does not represent a significant quantity.

22. Maintenance of minimum perennial streamflows would be in the public interest.

23. Material improvement in minimum low flows cannot be achieved without the development of storage.

24. Attainment of flows recommended by the fisheries interests will be achieved only through storage.

25. Pollution will continue to be a major problem.

26. Increases of population and the need to serve presently unsewered areas, will require municipal sewerage works to be expanded.

27 Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

28. Drainage of agricultural and suburban lands is a major problem in the basin.

29. There are flood problems in the basin.

30. Existing flood control reservoirs have materially reduced flood damages.

31. There are physically feasible storage sites in the basin.

32. Certain river sections and numerous minor streams and creeks are by nature of their physiography, location, land ownership, or economic potential available only for limited resource needs.

33. Establishment of restrictions on further appropriations on some streams would prevent an increase in depletion potential and aid in maintaining minimums where streams are not now appropriated beyond their natural capacity at critical points.

34. The maximum beneficial use of the waters of the Willamette River Main Stem - Long Tom River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with ORS 536.300 (2) pertaining to the water resources of the Willamette River Main Stem - Long Tom River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Willamette River Main Stem - Long Tom River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses and the waters of the Willamette River Main Stem - Long Tom River Basin are hereby so classified with the following exception:

> No application for appropriation of water shall be accepted or issued by any state agency except appropriations for domestic or livestock use or appropriations for beneficial use involving water legally stored in excess of or that necessary for existing rights, of the waters of Coyote and Spencer Creeks.

B. For the purpose of obtaining the highest and best use of waters released from storage, no appropriations of water except for domestic or livestock uses shall be made or granted by any state agency or public corporation of the state from the Long Tom River above U.S.G.S. Gage No. 14-1700 (NE 1/4 Section 33, Township 14 S., Range 5 W.) at Monroe, Oregon for waters released from storage of up to 370 cubic feet per second measured at the aforementioned gage.

C. Applications for the use of the waters of the Willamette River Main Stem - Long Tom River Basin shall not be accepted by any state agency for any other use and the granting of applications

for such other uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

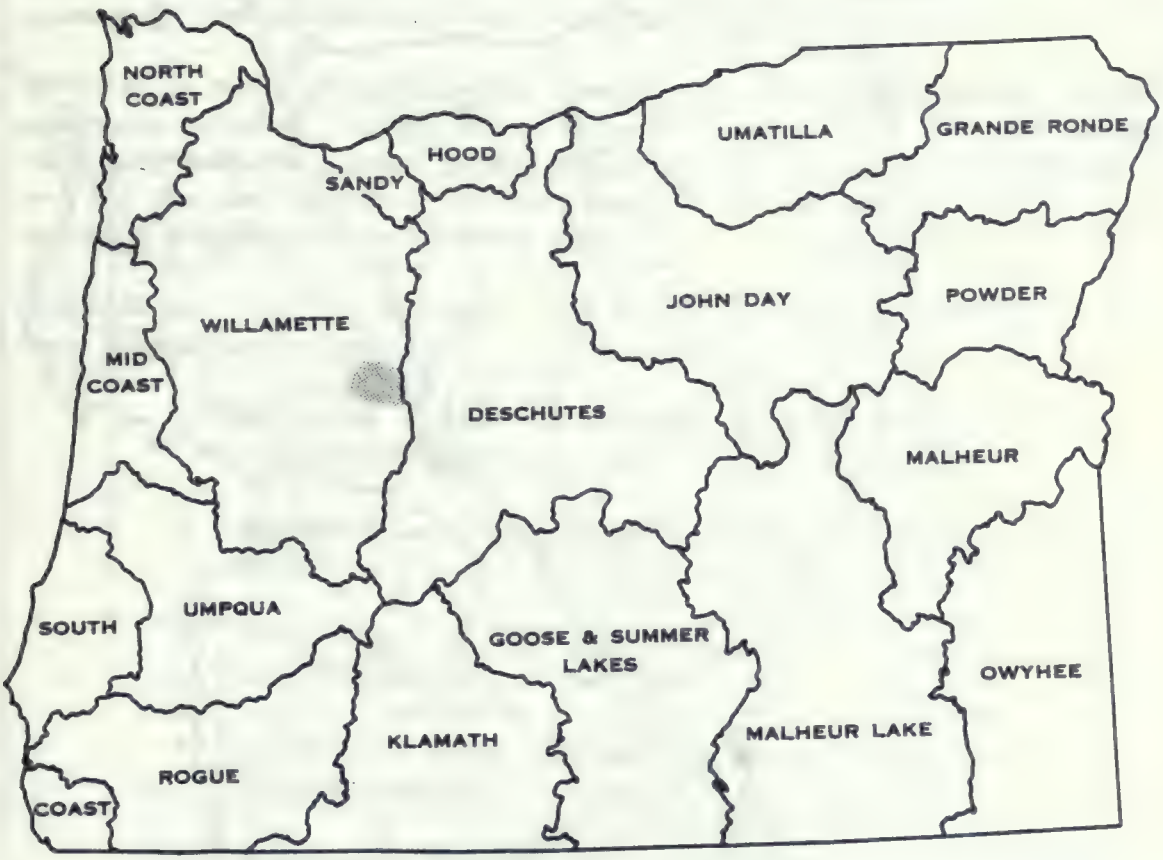
Done and dated this 10th day of November 1980.

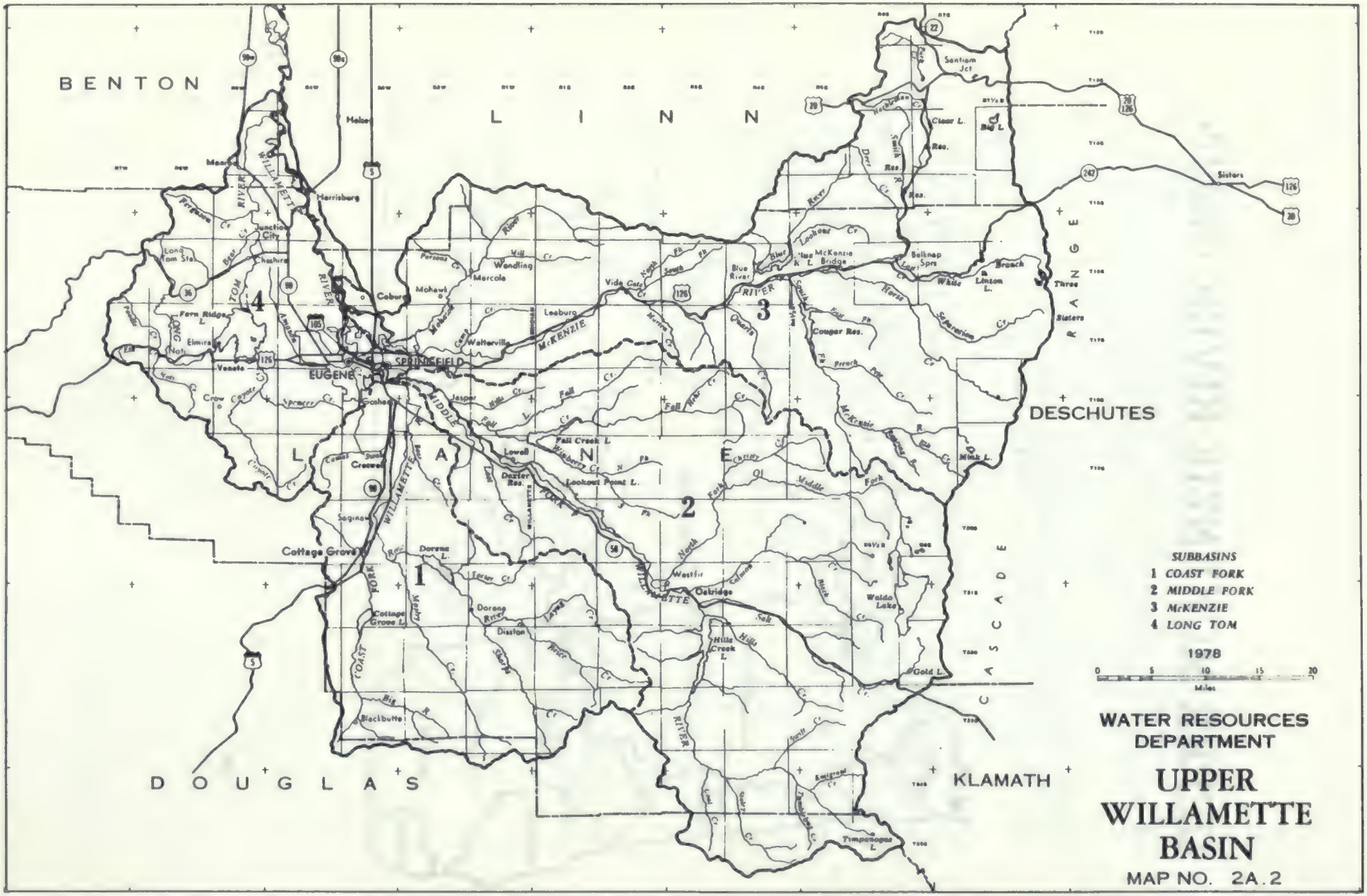
WATER POLICY REVIEW BOARD

By _____
Donel J. Lane, Chairman

2907

UPPER MCKENZIE RIVER BASIN




BENTON
LINN
DESCHUTES
DOUGLAS
KLAMATH
CASCADE RANGE
EUGENE
SPRINGFIELD
Cottage Grove
Harrisburg
Sisters
Santiam Jct
McKenzie Bridge
Oakridge
Westfir
Dexter Res.
Lookout Point L.
Fall Creek L.
Cougar Res.
Hills Creek L.
Timpanogas L.
Waldo Lake
Gold L.
Blue River
Belknap Spgs
Junction City
Coburg
Mohawk
Marcola
Walterville
Leaburg
Lowell
Dorena L.
Cottage Grove L.
Diston
Blackbutte
Crow
Vaughn
Elmira
Fern Ridge L.
Long Tom Str.
Creswell
Saginaw
Jasper
Goshen
Vida
Wendling
Mohawk R.
McKenzie R.
Willamette R.
Middle Fork
Coast Fork
Long Tom R.
Row R.
Calapooia R.
Fall Creek
Lookout Creek
Quartz Creek
Horse Creek
Three Sisters
Linton L.
Clear L.
Big L.
Smith Res.
Deer Creek Res.
Hackleman Cr.
Lookout Cr.
Blue R.
Scott Cr.
Smith R.
Deadwood Cr.
Timpanogas Cr.
Hills Creek
Salt Cr.
Row R.
Dorena Res.
Row R.
Coast Fork
Dorena Res.
Layng Cr.
Shotpouch Cr.
Big R.
Row R.
Willamette R.
Middle Fork
North Fork
Calapooia
Hills Creek
Scott Cr.
Deadwood Cr.
Timpanogas Cr.
Smiley Cr.
Lost Cr.
Quartz Cr.
Row R.
Willamette R.
Middle Fork
Coast Fork
Long Tom R.
Row R.
Calapooia R.
Fall Creek
Lookout Creek
Quartz Creek
Horse Creek
Three Sisters
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Clear L.
Big L.
Smith Res.
Deer Creek Res.
Hackleman Cr.
Lookout Cr.
Blue R.
Scott Cr.
Smith R.
Deadwood Cr.
Timpanogas Cr.
Hills Creek
Salt Cr.
Row R.
Dorena Res.
Row R.
Coast Fork
Dorena Res.
Layng Cr.
Shotpouch Cr.
Big R.
Row R.
Willamette R.
Middle Fork
North Fork
Calapooia
Hills Creek
Scott Cr.
Deadwood Cr.
Timpanogas Cr.
Smiley Cr.
Lost Cr.
Quartz Cr.
Row R.
Willamette R.
Middle Fork
Coast Fork
Long Tom R.
Row R.
Calapooia R.
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Lookout Creek
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Timpanogas Cr.
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Row R.
Coast Fork
Dorena Res.
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Shotpouch Cr.
Big R.
Row R.
Willamette R.
Middle Fork
North Fork
Calapooia
Hills Creek
Scott Cr.
Deadwood Cr.
Timpanogas Cr.
Smiley Cr.
Lost Cr.
Quartz Cr.
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SUBBASINS
1 COAST FORK
2 MIDDLE FORK
3 McKENZIE
4 LONG TOM
1978
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Miles
WATER RESOURCES DEPARTMENT
UPPER WILLAMETTE BASIN
MAP NO. 2A.2

BEFORE THE STATE WATER RESOURCES BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Upper McKenzie River Basin

Upper McKenzie River Basin

April 3, 1964

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of that portion of the McKenzie River, including tributaries located above river mile 76.9, which is that portion of the McKenzie River Basin upstream of the intersection of the Lane-Linn County Line and the river;

WHEREAS in this study consideration was given to means and methods of augmenting such water resources; existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement, as well as other related subjects, including drainage and reclamation; and

WHEREAS as a result of said study, the following findings and conclusions have been reached by this board:

1. Quantities of water are sufficient to satisfy all existing and contemplated needs and uses of water in the study area.

2. Recreation uses represent and will continue to bring substantial benefits to the state.

3. Fish life and wildlife uses represent and will continue to bring substantial benefits to the state.

4. Hydroelectric power production in part of the area will bring substantial benefits to the state.

5. Domestic use does not represent a significant quantity either for existing or contemplated needs.

6. Mining purposes represent no appreciable utilization at present or in the foreseeable future.

7. Municipal use is not a significant factor for either existing or contemplated needs.

8. Pollution abatement is not a significant factor for either existing or contemplated needs.

9. *Industrial use is not a significant factor for either existing or contemplated needs.*

10. *Irrigation use is not a significant factor for either existing or contemplated needs.*

11. *Drainage and reclamation are not at present or contemplated factors in water use.*

12. *The maximum beneficial use of that portion of the McKenzie River from and including Clear Lake, Linn County, Oregon to river mile 84.5 (below Middle Falls) is for recreation, fish and wildlife purposes, and no appropriations of water in this area should be permitted except for domestic use. Such power site withdrawals as may exist in this area are in conflict with this conclusion and should be rescinded.*

13. *The hydroelectric potential from river mile 84.5 (below Middle Falls) to river mile 76.9 (below the mouth of the Smith River) should be utilized. Such utilization is hereby encouraged for any properly licensed hydroelectric projects commensurate with multiple-purpose use for recreation, fish and wildlife and constructed and operated in accordance with plans approved by the State Water Resources Board. Projects constructed for hydroelectric power purposes must include regulation facilities to minimize river flow fluctuations resulting from project operation to protect downstream recreation, fish and wildlife values.*

14. *The waters of Smith River and Bunchgrass Creek should be utilized for hydroelectric purposes commensurate with the multiple-purpose use for recreation, fish and wildlife. Projects to utilize these waters should be constructed and operated in accordance with plans approved by the State Water Resources Board.*

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with the provisions of ORS 536.300 (2) relating to the water of the Upper McKenzie River Basin.

A. *The maximum economic development of the state and the attainment of the highest and best use of the waters of the Upper McKenzie River from Clear Lake, Linn County, Oregon to river mile 84.5 (below Middle Falls) and the attainment of an integrated and balanced program for the benefit of the state as a whole, will be achieved through utilization of the aforementioned waters for*

domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, recreation, fish, and wildlife purposes and the aforementioned waters of the Upper McKenzie River are hereby so classified.

B. Applications for the use of such water shall not be accepted by any state agency for any other purpose and applications for such other purposes are declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

C. The maximum economic development of this state and the attainment of the highest and best use of the waters of the Upper McKenzie River from river mile 84.5 (below Middle Falls) to river mile 76.9 (below the mouth of Smith River), including Smith River and Bunchgrass Creek, will be attained through utilization of such waters for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, hydroelectric power, fish, wildlife, and recreation purposes and the aforementioned waters of the Upper McKenzie River are hereby so classified.

D. Applications for the use of such water shall not be accepted by any state agency for any other purpose and applications for such other purposes are declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

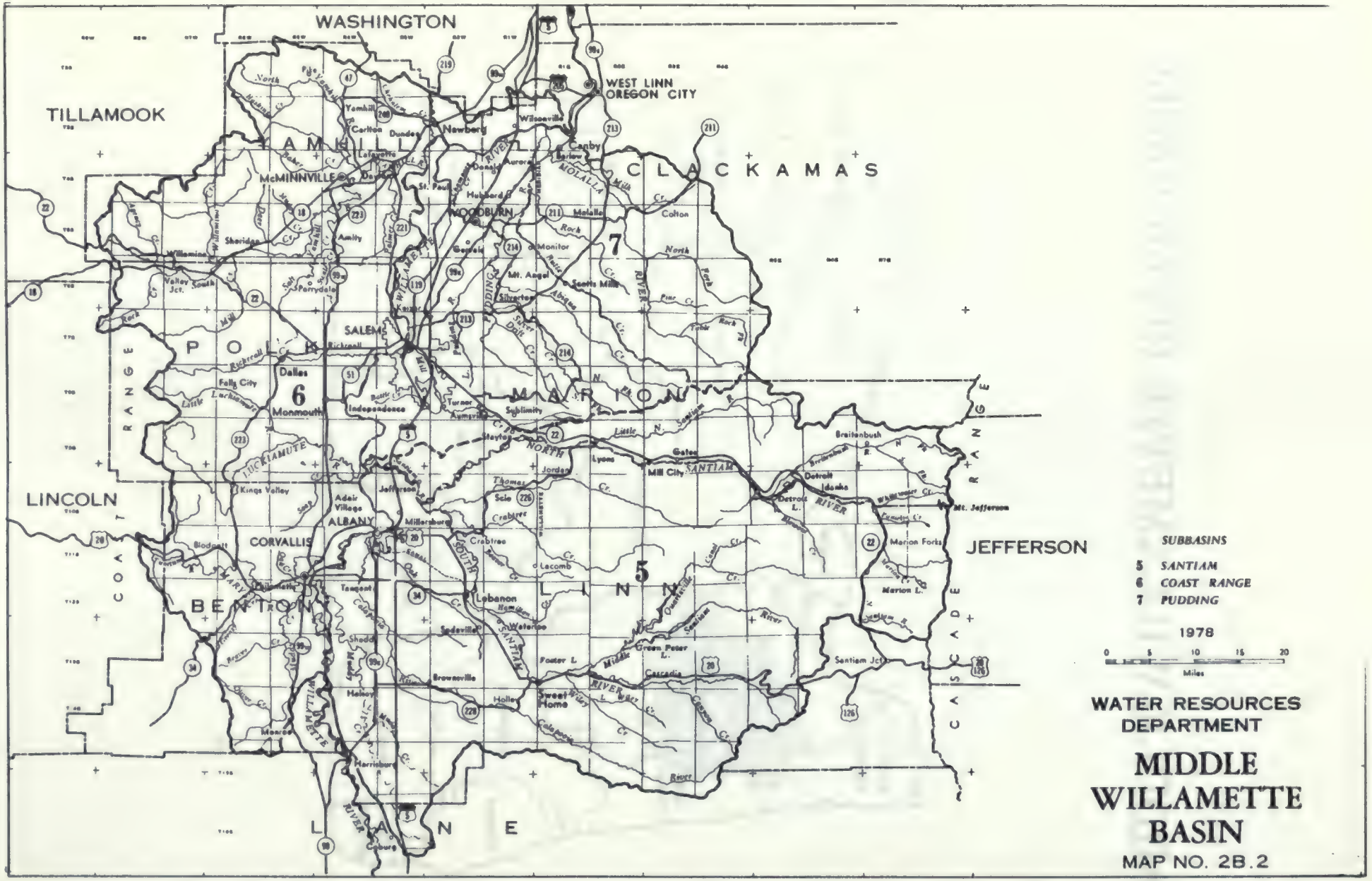
E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications, are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

Done and dated this 3rd day of April 1964.

STATE WATER RESOURCES BOARD

By _____
Donel J. Lane, Secretary

MIDDLE WILLAMETTE RIVER BASIN



WATER RESOURCES DEPARTMENT

MIDDLE WILLAMETTE BASIN

MAP NO. 2B.2

BEFORE THE STATE WATER RESOURCES BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Middle Willamette River Basin	)))))	Middle Willamette River Basin June 22, 1964

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Middle Willamette River Basin as delineated on State Water Resources Board Map, File No. 2B.70146;

WHEREAS results of this study have been published in the State Water Resources Board Report, Middle Willamette River Basin, dated June 1963;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of said study the following findings and conclusions were reached by this board:

1. Total quantities of surface water on an average annual basis are adequate to meet existing and contemplated future needs for water, with the exception of the utilization of water to minimize pollution in lieu of adequate treatment.

2. There is insufficient surface yield during low flow periods to meet present demands in many areas, and to meet future demands in most areas.

3. The ground water resource is inadequate in both quantity and quality in many areas to meet existing needs.

4. Augmentation of water supply during low flow periods can come through storage of surplus runoff.

5. There are large quantities of unappropriated water which come under the jurisdiction of the State Water Resources Board, the exact amount of which is undetermined.

6. There is an urgent need to adjudicate claims for the waters of the Upper, Middle, and Lower Willamette Basins to permit identification of unappropriated water, to relate the supply to both legal and actual use, and to permit proper planning for development to meet future needs.

7. Power claims at Willamette Falls, which date back to 1852, total about 30,000 cubic feet per second. This is equivalent to about 21 million acre-feet on an annual basis which is slightly more than the total average annual yield of the Upper and Middle Willamette Basins. There will be a cloud on all water rights issued subsequent to 1852 until these power claims are adjudicated.

8. Domestic, livestock, and wildlife uses, while important, represent comparatively small quantities of water in existing and contemplated future needs.

9. Municipal use is and will continue to be one of the major consumptive uses of water. Supply sources generally are adequate and many municipalities have obtained water rights for future expansion.

10. Normal precipitation during summer months is not sufficient in the Middle Willamette Basin to attain maximum crop production. Irrigation is thus required if the farmer is to realize maximum benefit from his land.

11. Irrigation is the major consumptive use of water and there are large areas of potentially irrigable land. Storage supplies are necessary for about 75 percent of the potentially irrigable land.

12. Industrial use is and will probably continue to be one of the major consumptive uses of water. Present municipal and industrial rights are generally more than adequate to meet estimated needs for 1985, but storage will be needed in some areas to provide a dependable supply.

13. Present mining use is small and is associated primarily with sand and gravel operations in which the consumptive use is minor.

14. The remaining hydroelectric potential of the basin that is economically feasible for development is small. There are plans for power development in Corps of Engineers multipurpose dams (planned or under construction) on the Santiam River.

15. Recreational use of the streams and lakes of the basin is of major importance and is associated primarily with camping, boating, swimming, and sports fishing.

16. Cost and benefit allocations for existing projects will be reviewed and are subject to modification upon completion of the current Willamette Basin Review Study.

17. The Little North Santiam River, Wiley Creek, Breitenbush River, and the

upper reaches of Calapooia River, North Santiam River, Middle Santiam River, South Santiam River, Molalla River, and the high mountain lakes provide outstanding recreational values and should have their use restricted primarily for recreational purposes.

18. Use of the basin's stream system by anadromous fish is of major importance, both to the basin and to the state.

19. Maintenance of adequate minimum streamflows is important to fish life, wildlife, recreation, and water quality control.

20. Pollution of surface water is a serious problem in the basin, particularly in the main stem of the Willamette River and in other streams during periods of low flow. Utilization of flows to minimize other than residual pollution should not be permitted.

21. Serious damages, caused by flooding and erosion, are annual occurrences. Detroit Reservoir in the Middle Willamette Basin and flood control structures in the Upper Willamette Basin have resulted in substantial benefits.

22. Drainage problems exist on a large portion of the basin's arable lands.

23. Physical and economic factors justify limited-purpose use of certain waters.

24. The construction and operation of all projects must be related to the various beneficial uses of water and to an overall comprehensive and orderly development of the water resources of the entire basin.

25. Low water temperatures are an outstanding characteristic of streams originating in the High Cascades. Water quality requirements will be served by maintaining thermal benefits resulting from the influence of Cascade streams, and by enhancing thermal conditions in all streams where high water temperatures are now a problem.

26. The highest and best use of the waters of the Middle Willamette Basin is for domestic, livestock, municipal, irrigation, industrial, power, mining, recreation, wildlife, and fish life purposes.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with ORS 536.300 (2) pertaining to the water resources of the Middle Willamette Basin:

A. The maximum economic development of this state, the attainment of the

highest and best use of the waters of the Middle Willamette Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power, industrial, mining, recreation, wildlife, and fish life uses and the waters of the Middle Willamette Basin are hereby so classified with the following exceptions:

1. *The maximum economic development of this state, the attainment of the highest and best use of the waters of all natural lakes of the Middle Willamette Basin situated above an elevation of 2,000 feet mean sea level, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development not to exceed 7½ theoretical horsepower, recreation, wildlife, and fish life uses and the waters of all natural lakes of the Middle Willamette Basin situated above an elevation of 2,000 feet mean sea level are hereby so classified.*

2. *The maximum economic development of this state, the attainment of the highest and best use of the waters of the upper reaches of the streams listed below, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development not to exceed 7½ theoretical horsepower, recreation, wildlife, and fish life uses, and the upper reaches of the following streams are hereby so classified:*

   (a) *The Little North Santiam River and Henline Creek, and their tributaries, above their confluence (Section 33, Township 8S., Range 4E.).*

   (b) *Wiley and Little Wiley Creeks, and their tributaries, above their confluence (Section 7, Township 14S., Range 2E.).*

   (c) *The Breitenbush River and its tributaries.*

   (d) *The Calapooia River, and its tributaries, above its confluence with Bigs Creek (Section 7, Township 15S., Range 2E.).*

   (e) *The North Santiam River, and its tributaries, above its confluence with Tunnel Creek (Section 20, Township 10S., Range 7E.).*

(f) The Middle Santiam River, and its tributaries, above the Green Peter Reservoir (Section 19, Township 12S., Range 4E.).

(g) Quartsville Creek, and its tributaries, above its confluence with Panther Creek (Section 10, Township 12S., Range 3E.).

(h) The South Santiam River, and its tributaries, above its confluence with Trout Creek (Section 32, Township 13S., Range 4E.).

(i) The Molalla River, and Table Rock Fork, and their tributaries, above their confluence (Section 14, Township 7S., Range 3E.).

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, and of attaining the highest and best use of waters released from storage, no appropriations of water except for domestic or livestock uses or waters to be legally stored or legally released from storage shall be made or granted by any state agency or public corporation of the state for the waters of:

1a. The Calapooia River or its tributaries above USGS Gage No. 14-1720 (SE¼, Section 15, Township 14S., Range 1W.) at Holley, Oregon for natural flows of the Calapooia River below 30 cubic feet per second plus waters released from storage of up to 340 cubic feet per second measured at the aforementioned gage.

1b. The Calapooia River or its tributaries above USGS Gage No. 14-1735 (NW¼ Section 13, Township 11S., Range 4W.) at Albany, Oregon for natural flows of the Calapooia River below 20 cubic feet per second plus waters released from storage of up to 340 cubic feet per second measured at the aforementioned gage.

2a. The South Santiam River or its tributaries above USGS - Corps of Engineers - State Engineer Gage No. 14-1850 (SE¼ Section 36, Township 13S., Range 2E.) below Cascadia, Oregon for flows of the South Santiam River below 50 cubic feet per second measured at the aforementioned gage.

2b. The Middle Santiam River or its tributaries above USGS Gage No. 14-1865 (NE¼SE¼ Section 24, Township 13S., Range 1E.) near Foster, Oregon for natural flows of the Middle Santiam River or its tributaries below 110 cubic feet per second plus waters released from storage of up to 260 cubic feet per second measured at the aforementioned gage.

2c. Wiley Creek or its tributaries above Wiley Creek - South Santiam

River confluence for flows of Wiley Creek below 10 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

2d. The South Santiam River or its tributaries above USGS - Corps of Engineers - State Engineer Gage No. 14-1875 (SW¼NW¼ Section 28, Township 12S., Range 1W.) at Waterloo, Oregon for natural flows of the South Santiam River below 170 cubic feet per second plus waters released from storage of up to 930 cubic feet per second measured at the aforementioned gage.

3a. The North Santiam River or its tributaries above USGS Gage No. 14-1780 (SE¼NW¼ Section 17, Township 10S., Range 6E.) near Detroit, Oregon for flows of the North Santiam River below 345 cubic feet per second measured at the aforementioned gage.

3b. The North Santiam River or its tributaries above USGS Gage No. 14-1815 (NE¼NE¼ Section 34, Township 9S., Range 4E.) at Niagara, Oregon for natural flows of the North Santiam River below 500 cubic feet per second plus waters released from storage of up to 640 cubic feet per second measured at the aforementioned gage.

3c. The Little North Santiam River or its tributaries above USGS - State Engineer Gage No. 14-1825 (NW¼ Section 16, Township 9S., Range 2E.) near Mehama, Oregon for flows of the Little North Santiam River below 40 cubic feet per second measured at the aforementioned gage.

3d. The North Santiam River or its tributaries above USGS Gage No. 14-1830 (NW¼ Section 18, Township 9S., Range 2E.) at Mehama, Oregon for natural flows of the North Santiam River below 580 cubic feet per second plus waters released from storage of up to 640 cubic feet per second measured at the aforementioned gage.

3e. The North Santiam River or its tributaries above USGS Gage No. 14-1841 (Section 7, Township 10S., Range 2W.) near Jefferson, Oregon for natural flows of the North Santiam River below 430 cubic feet per second plus waters released from storage of up to 640 cubic feet per second measured at the aforementioned gage.

4a. The Santiam River or its tributaries above USGS Gage No. 14-1890 (SE¼ Section 11, Township 10S., Range 3W.) at Jefferson, Oregon for natural flows of the Santiam River below 330 cubic feet per second plus waters released from storage of up to 1,570 cubic feet per second measured at the aforementioned gage.

4b. *The Santiam River or its tributaries above the Santiam River - Willamette River confluence for natural flows of the Santiam River below 320 cubic feet per second plus waters released from storage of up to 1,570 cubic feet per second measured at a point between the said confluence and 1.0 miles above said confluence.*

5a. *The Marys River or its tributaries above USGS Gage No. 14-1710 (NE¼SE¼ Section 18, Township 12S., Range 5W.) near Philomath, Oregon for flows of the Marys River below 10 cubic feet per second measured at the aforementioned gage.*

5b. *The Marys River or its tributaries above the Marys River - Willamette River confluence for flows of the Marys River below 5 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.*

6a. *The Luckiamute River or its tributaries above USGS - State Engineer Gage No. 14-1895 (NE¼ Section 11, Township 10S., Range 7W.) near Hoskins, Oregon for flows of the Luckiamute River below 10 cubic feet per second measured at the aforementioned gage.*

6b. *The Luckiamute River or its tributaries above USGS Gage No. 14-1900 (SE¼ Section 33, Township 9S., Range 6W.) at Pedee, Oregon for flows of the Luckiamute River below 20 cubic feet per second measured at the aforementioned gage.*

6c. *The Luckiamute River or its tributaries above USGS Gage No. 14-1905 (SW¼SW¼ Section 18, Township 9S., Range 4W.) near Suver, Oregon for flows of the Luckiamute River below 25 cubic feet per second measured at the aforementioned gage.*

6d. *The Luckiamute River or its tributaries above the Luckiamute River - Willamette River confluence for flows of the Luckiamute River below 20 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.*

7. *Rickreall Creek or its tributaries above USGS Gage No. 14-1907 (SE¼SW¼ Section 35, Township 7S., Range 6W.) near Dallas, Oregon for flows of Rickreall Creek below 5 cubic feet per second measured at the aforementioned gage.*

8a. *The South Yamhill or its tributaries above USGS - State Engineer Gage No. 14-1925 (Section 14, Township 6S., Range 7W.) near Willamina, Oregon for flows of the South Yamhill River below 20 cubic feet per second measured at the aforementioned gage.*

8b. *Willamina Creek or its tributaries above USGS - Corps of Engineers - State Engineer Gage No. 14-1930 (near ¼ corner Sections 12 and 13, Township 5S., Range 7W.) near Willamina, Oregon for flows of Willamina Creek below 20 cubic feet per second measured at the aforementioned gage.*

8c. *The South Yamhill River or its tributaries above USGS Gage No. 14-1940 (NW¼ Section 5, Township 5S., Range 4W.) near Whiteson, Oregon for flows of the South Yamhill River below 15 cubic feet per second measured at the aforementioned gage.*

8d. *The North Yamhill River or its tributaries above USGS Gage No. 14-1970 (NW¼ Section 25, Township 2S., Range 5W.) at Pike, Oregon for flows of the North Yamhill River below 10 cubic feet per second measured at the aforementioned gage.*

9. *The Yamhill River or its tributaries above USGS Gage No. 14-1975 - discontinued - (Section 7, Township 4S., Range 3W.) at Lafayette, Oregon for flows of the Yamhill River below 15 cubic feet per second measured at the aforementioned gage.*

10a. *The Pudding River or its tributaries above USGS Gage No. 14-2010 (SE¼ Section 8, Township 6S., Range 1W.) near Mt. Angel, Oregon for flows of the Pudding River below 10 cubic feet per second measured at the aforementioned gage.*

10b. *The Pudding River or its tributaries above USGS - State Engineer Gage No. 14-2020 (SE¼ Section 12, Township 4S., Range 1W.) at Aurora, Oregon for flows of the Pudding River below 35 cubic feet per second measured at the aforementioned gage.*

11a. *The Molalla River or its tributaries above USGS - Corps of Engineers - State Engineer Gage No. 14-1985 (SE¼SE¼ Section 30, Township 6S., Range 3E.) near Wilhoit, Oregon for flows of the Molalla River below 35 cubic feet per second measured at the aforementioned gage.*

11b. *The Molalla River or its tributaries above USGS Gage No. 14-2000 (Section 9, Township 4S., Range 1E.) near Canby, Oregon for flows of the Molalla River below 60 cubic feet per second measured at the aforementioned gage.*

12a. *The Willamette River or its tributaries above USGS Gage No. 14-1740 (SW¼ Section 6, Township 11S., Range 3W.) at Albany, Oregon for natural flows of the Willamette River below 1,750 cubic feet per*

second plus waters released from storage of up to 3, 140 cubic feet per second measured at the aforementioned gage.

12b. The Willamette River or its tributaries above USGS Gage No. 14-1910 (SW¼ Section 22, Township 7S., Range 3W.) at Salem, Oregon for natural flows of the Willamette River below 1, 300 cubic feet per second plus waters released from storage of up to 4, 700 cubic feet per second measured at the aforementioned gage.

12c. The Willamette River or its tributaries above USGS Gage No. 14-1980 (SE¼ Section 23, Township 3S., Range 1W.) at Wilsonville, Oregon for natural flows of the Willamette River below 1, 500 cubic feet per second plus waters released from storage of up to 4, 700 cubic feet per second measured at the aforementioned gage.

C. Applications for the use of the waters of the Middle Willamette Basin shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses.

E. Rights to use of water for power purposes granted by any state agency shall be issued only on condition that the project operation shall be compatible with other beneficial uses.

F. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536. 310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

Done and dated this 22nd day of June, 1964.

STATE WATER RESOURCES BOARD

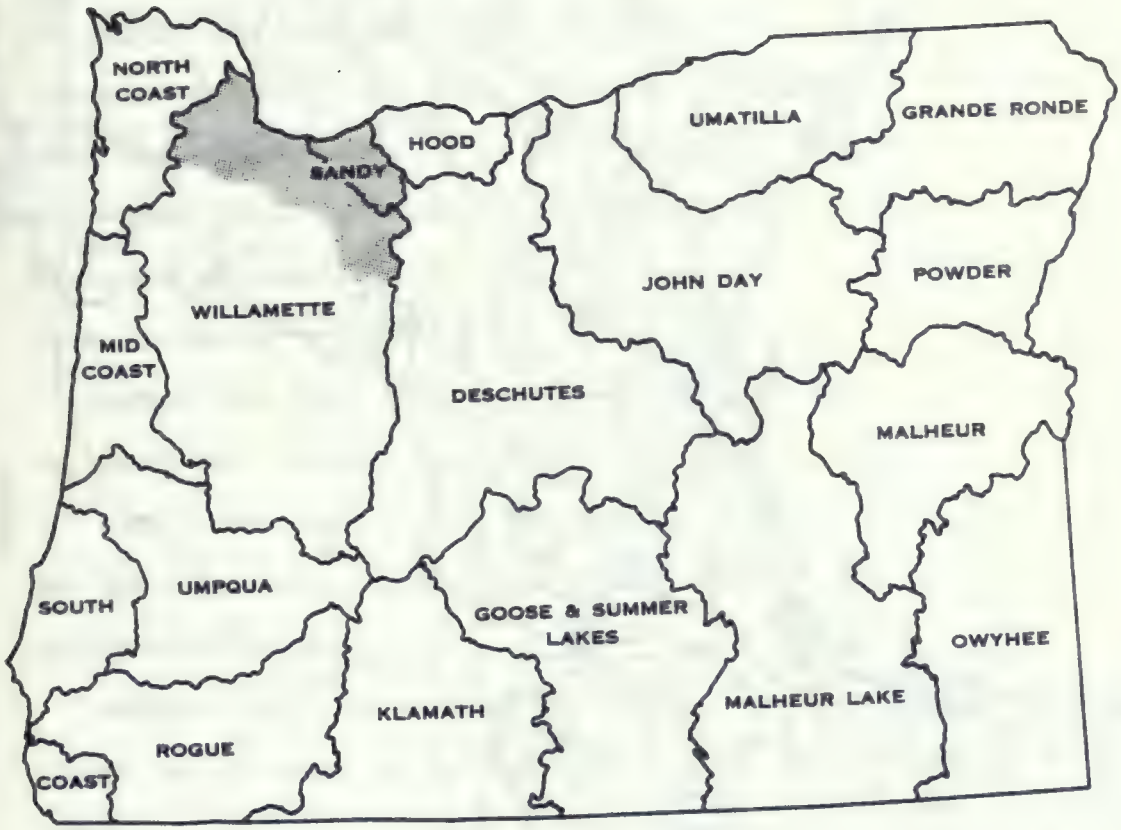
By _____
Donel J. Lane, Secretary

Middle Willamette Basin Program

The State Water Resources Board on April 20, 1966, approved an exception to the Middle Willamette Basin program to allow the city of Detroit, Oregon to use one cubic foot per second of the waters of Breitenbush River for municipal purposes.

The State Water Resources Board on April 11, 1969, approved an exception to the Middle Willamette Basin program for utilization of 0.50 cubic foot per second of the water of Mansfield Creek, a tributary of Breitenbush River, for municipal use.

LOWER WILLAMETTE RIVER BASIN



WASHINGTON
COLUMBIA
CLARK
SKAMANIA
WASHINGTON
TILLAMOOK
HOOD RIVER
MULTNOMAH
PORTLAND
YAMHILL
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STATE WATER RESOURCES BOARD
LOWER WILLAMETTE BASIN
MAP NO. 2C.2

BEFORE THE WATER POLICY REVIEW BOARD

FOR THE STATE OF OREGON

In the Matter of Formulating an Integrated, Coordinated Program for the Use and Control of the Water Resources of the Lower Willamette River Basin	Lower Willamette River Basin* December 9, 1980

WHEREAS the State Water Resources Board under the authority of ORS 536.300 completed a study of the Lower Willamette River Basin as delineated on State Water Resources Board Map, File No. 2C.6, dated 1963;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 adopted a program dated May 25, 1966 to classify the water resources of the Lower Willamette River Basin;

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Lower Willamette River Basin;

WHEREAS THE Water Policy Review Board under the authority of ORS 536.300 and ORS 536.340 has undertaken a restudy of the water resources of the Lower Willamette River Basin;

WHEREAS this program does not modify, set aside or alter any existing rights to use water or the priority of such use established under existing laws;

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* Modifies Lower Willamette River Basin Programs dated May 25, 1966, August 26, 1968, April 15, 1970, April 20, 1971, April 19, 1975, October 8, 1976, July 28, 1980.

WHEREAS in all studies consideration was given to means and methods of augmenting, conserving and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, flood plains, and reservoir sites; and

WHEREAS as a result of said studies the following findings have been reached by this Board:

1. The total surface water yield of nearly 6,300,000 acre-feet is more than enough to satisfy all existing and foreseeable needs within the basin, both on an average and a critical year basis.
2. Only about seven percent of the annual yield occurs during the summer months of June through October. This, coupled with poor geographic distribution, results in seasonal water shortages in some areas.
3. Augmentation of water supply during low flow periods can be obtained through storage of winter flows.
4. There are unappropriated surface waters in the Lower Willamette Basin which come under the jurisdiction of the Water Policy Review Board, the exact amount of which is undetermined.
5. There is an urgent need to adjudicate the claims for the waters of the Lower Willamette Basin to permit identification of unappropriated water, to relate supply to both legal and actual use, and to permit proper planning for development to meet further needs. This is particularly urgent for the waters of Willamette Falls, where power claims totaling 30,155 cfs exist dating prior to 1909. Until these claims are adjudicated there will be a cloud on all subsequent appropriations upstream of Willamette Falls.

6. Domestic, livestock, mining, and wildlife uses represent comparatively small quantities of water in existing and contemplated future needs.

7. Almost 90 percent of the people within the basin rely on municipal water systems.

8. There appears to be no immediate problem concerning municipal water supply in that portion of the Tualatin Subbasin east of the Aloha-Huber area. However, there is an impending shortage west of this area. It is anticipated that the requirements for municipal water will increase approximately two and one-half times by 1985 to about 226,000 acre-feet annually. It is expected that about 97 percent of this will be supplied from surface sources and the balance from wells.

9. The Clackamas River has a high potential of good quality water with an average annual yield of over 2,000,000 acre-feet. It presently provides water to over 30,000 people.

10. The Sandy Subbasin, including the important Bull Run River watershed, will continue to be the principal municipal water supply source in the basin.

11. The Lower Willamette Basin is and is expected to remain a power deficient area in relation to generating capacity. The greatest value of its power generation is in its utilization to meet peak loads.

12. Opportunities exist for small power development projects in the Clackamas and Tualatin Subbasins.

13. Normal precipitation during summer months is not sufficient in the Lower Willamette Basin to attain maximum crop production. Irrigation

will be required if the farmer is to realize maximum benefit from his land.

14. There are about 200,000 acres of potentially irrigable land in the basin. Approximately 35,000 acres are now irrigated using 90,000 acre-feet of water. If the present trend toward more irrigation continues, an additional 45,000 acres will be irrigated by 1985. This will require an additional diversion of about 110,000 acre-feet of water for a grand total in 1985 of about 200,000 acre-feet.

15. Present industrial water use is estimated to be 120,000 acre-feet annually of which over 100,000 acre-feet are supplied from surface water. It is expected that industrial water use will double by 1985. Much of the industrial water comes from municipal sources and needs are expected to continue to be served primarily by municipal systems.

16. The Columbia Subbasin has the highest potential of the basin for industrial development.

17. Although much of the water diverted for industrial use is returned, its quality is generally impaired, which is a matter of serious concern throughout the basin.

18. Water-based recreation is of major economic and social value to the basin and to the state. Recreation requirements for water of suitable quality will probably continue to grow at an accelerated rate, however, this use is mainly nonconsumptive.

19. The upper reaches of the Clackamas River watershed, situated predominately in the Mt. Hood National Forest and abounding with numerous lakes, constitute one of the principal recreational areas in the basin. Almost all of these natural lakes are situated above an ele-

vation of 3,000 feet mean sea level, and they together with the upper reaches of the streams provide outstanding recreational values and their waters should be classified primarily for recreational purposes.

20. The streams of the basin have an extensive fish life population which consists of some 47 species of fish belonging to 13 families. This is important for in-basin recreation and also makes a significant contribution to Columbia River and Pacific Ocean sport and commercial fishing.

21. The seasonal low flows in the Tualatin Subbasin seriously affect fish life. Higher flows would facilitate re-establishment of runs of summer steelhead trout and fall chinook salmon.

22. There are many problems in the basin associated with fish life. Low flows, high temperatures, obstructions, and pollution are matters of serious concern. Correction of these detriments would enhance one of the basin's important assets.

23. The Clackamas River system is considered the most important salmon and steelhead producer in the Lower Willamette Basin.

24. The Clackamas River between the bridge at Carver and River Mill Dam is a designated State Scenic Waterway.

25. While there has been a general improvement in the physical, chemical, and bacteriological quality of the water in much of this basin during the past 15 years, pollution of the Willamette River remains a matter of concern at the local and state levels.

26. Water should not be used for pollution abatement in lieu of adequate treatment. However, for the foreseeable future some water will be required for flushing out residual wastes.

27. The Department of Environmental Quality has specified 250 cfs as the streamflow necessary to maintain adequate water quality in the Tualatin River.

28. Water quality needs of the Tualatin River will be met from established minimum flows and stored water.

29. Minimum perennial streamflows have been established on the lower reach of the Tualatin River for protection of aquatic life and water quality maintenance.

30. Unappropriated natural streamflows and releases from Scoggins Reservoir will be inadequate to meet projected water quality requirements for dilution during June through October.

31. Normal natural streamflows are inadequate to meet actual demands and the maximum demand of existing water rights (legal demands) from July 31 through September 15.

32. Natural streamflows are inadequate to meet SWRB 1966 minimum flows and other legal demands on water during July through September.

33. Natural streamflows are inadequate to meet SWRB 1970 minimum flows and other legal demands on water during June through September.

34. Releases from storage behind Scoggins Dam have improved water quality in the Tualatin River. Additional storage possibilities are being investigated to meet projected future needs.

35. In the Clackamas Subbasin, minimum perennial streamflows for the protection of aquatic life should be set at selected points along the Clackamas River and at the mouths of its tributaries, Clear Creek, Deep Creek, Eagle Creek, Fish Creek, Roaring River, and Collawash River.

36. In the Columbia Subbasin minimum perennial streamflows for the protection of aquatic life should be set on Milton Creek and its tributaries, Cox and Salmon Creeks, during the storage period and on North and South Scappoose Creeks and their tributaries, Alder, Cedar, Lizzie, North Fork of North Scappoose, Deep, South Fork of North Scappoose, Gourlay, and Raymond Creeks.

37. There are streams in the Lower Willamette Basin that have been withdrawn by the Legislature or the State Engineer.

NOW, THEREFORE, BE IT RESOLVED that this Board hereby adopts the following program in accordance with ORS 536.300 (2) pertaining to the water resources of the Tualatin, Clackamas, Columbia, and the Sandy Subbasins of the Lower Willamette Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Lower Willamette Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters as follows:

In the TUALATIN SUBBASIN

Only for domestic, livestock, municipal, irrigation, power development, industrial, recreation, wildlife and fish life uses, with the following exceptions:

The Tualatin River mainstem to Lee Falls, the mainstems of McKay, Gales and Dairy Creeks, and the mainstems of East and West Forks of Dairy Creek are classified only for domestic, livestock, municipal, irrigation, power development in conjunction with existing power generating facilities, industrial, recreation, wildlife and fish life uses;

For a period from July 31 through September 15 of each year, all

waters are classified only for human and livestock consumption except that stored water may be used at any time for the above specified beneficial uses.

In the UPPER CLACKAMAS SUBBASIN (CLACKAMAS RIVER AND TRIBUTARIES ABOVE RIVER MILL DAM)

Only for domestic, livestock, municipal, power development, recreation, wildlife and fish life uses;

In the LOWER CLACKAMAS SUBBASIN

Only for domestic, livestock, municipal, irrigation, power development not to exceed 25 theoretical horsepower, recreation, wildlife and fish life uses, except as follows:

Clackamas River (mainstem) below River Mill Dam only for human consumption, livestock consumption, and instream use for recreation, wildlife and fish life uses.

The mainstems of Clear Creek, Deep Creek and Eagle Creek only for domestic, livestock, municipal, irrigation, recreation, wildlife and fish life uses.

In the SCAPPOOSE DRAINAGE OF THE COLUMBIA SUBBASIN

Where not affected by legislative withdrawals, only for domestic, livestock, municipal, recreation, wildlife, and fish life uses;

In the SANDY SUBBASIN

The tributaries of the Bull Run and Little Sandy Rivers only for the exclusive use of the City of Portland.

The waters of the Lower Willamette Basin are hereby so classified with the following exceptions:

1. The maximum economic development of this state, the attainment of the highest and best use of the waters of all natural lakes of the Lower Willamette Basin situated above an elevation of

3,000 feet mean sea level and Huxley Lake - (Section 33, Township 4 South, Range 6 East), and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommerical garden not to exceed one-half acre in area, power development not to exceed 7 1/2 theoretical horsepower, recreation, wildlife, and fish life uses, and the waters of all natural lakes, not withdrawn by legislation, of the Lower Willamette Basin situated above an elevation of 3,000 feet mean sea level and Huxley Lake are hereby so classified.

2. The maximum economic development of this state, the attainment of the highest and best use of the waters of the upper reaches of the streams listed below, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommerical garden not to exceed one-half acre in area, power development, recreation, wildlife, and fish life uses, and the following streams are hereby so classified:

Clackamas River and Fish Creek and their tributaries above their confluence (Section 2, Township 5 South, Range 5 East).

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and to minimize pollution and of attaining the highest and best use of waters released from storage, no appropriations of water except for domestic or livestock uses or

waters to be legally stored or legally released from storage shall be made or granted by any state agency or public corporation of the state for the waters of:

TUALATIN SUBBASIN

1. The Tualatin River or its tributaries above stream mile 70 (NE 1/4, Section 3, Township 1 South, Range 4 West) for flows of the Tualatin River below 10 cubic feet per second for the period beginning July 16 and ending November 15, 65 cubic feet per second for the period beginning November 16 and ending May 31, and 20 cubic feet per second for the period beginning June 1 and ending July 15, measured at or near stream mile 70.
2. Seine Creek or its tributaries above the mouth (SE 1/4, Section 18, Township 1 South, Range 4 West) for flows of Seine Creek below 2 cubic feet per second for the period beginning July 1 and ending November 15, 25 cubic feet per second for the period beginning November 16 and ending May 31, and 8 cubic feet per second for the month of June measured at or near the mouth.
3. Tanner Creek or its tributaries above the mouth (NE 1/4, Section 18, Township 1 South, Range 4 West) for flows of Tanner Creek below 1 cubic foot per second for the period beginning August 1 and ending September 30, and 9 cubic feet per second for the period beginning November 15 and ending May 31 measured at or near the mouth.
4. Gales Creek or its tributaries above the mouth (NE 1/4, Section 18, Township 1 South, Range 3 West) for flows of Gales Creek below 12 cubic feet per second for the period beginning July 16

and ending October 31, 100 cubic feet per second for the period beginning November 1 and ending May 31, and 35 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

5. Gales Creek or its tributaries above river mile 12 (Section 8, Township 1 North, Range 4 West) for flows of Gales Creek below 8 cubic feet per second for the period beginning September 1 and ending October 15, and 70 cubic feet per second for the period beginning November 15 and ending May 31 measured at or near river mile 12.

6. Beaver Creek or its tributaries above the mouth (NW 1/4, Section 23, Township 2 North, Range 5 West) for flows of Beaver Creek below 1 cubic foot per second for the period beginning July 16 and ending November 15, 17 cubic feet per second for the period beginning November 16 and ending May 31, and 3 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

7. Little Beaver Creek or its tributaries above the mouth (NW 1/4, Section 5, Township 1 North, Range 4 West) for flows of Little Beaver Creek below 1 cubic foot per second for the period beginning August 1 and ending September 30 measured at or near the mouth.

8. North Fork of Gales Creek or its tributaries above the mouth (NW 1/4, Section 20, Township 2 North, Range 5 West) for flows of North Fork Gales Creek below 1.5 cubic feet per second for the period beginning July 16 and ending November 15, 25 cubic feet per second for the period beginning November 16 and ending

May 31, and 3 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

9. South Fork of Gales Creek or its tributaries above the mouth (SW 1/4, Section 21, Township 2 North, Range 5 West) for flows of South Fork Gales Creek below 1 cubic foot per second for the period beginning July 16 and ending November 15, 20 cubic feet per second for the period beginning November 16 and ending May 31, and 2 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

10. East Fork Dairy Creek or its tributaries above river mile 13 (SW 1/4, Section 4, Township 2 North, Range 3 West) for flows of East Fork Dairy Creek below 12 cubic feet per second for the period beginning July 16 and ending November 15, 50 cubic feet per second for the period beginning November 16 and ending May 31, and 25 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near river mile 13.

11. Denny Creek or its tributaries above the mouth (NW 1/4, Section 28, Township 3 North, Range 3 West) for flows of Denny Creek below 2 cubic feet per second for the period beginning August 1 and ending November 15, 15 cubic feet per second for the period beginning November 16 and ending May 31, and 3 cubic feet per second for the period beginning June 1 and ending July 31 measured at or near the mouth.

12. Plentywater Creek or its tributaries above the mouth (SW 1/4, Section 28, Township 3 North, Range 3 West) for flows of Plentywater Creek below 1 cubic foot per second for the period beginning August 1 and ending November 15, 5 cubic feet per sec-

ond for the period beginning November 16 and ending May 31, and 2 cubic feet per second for the period beginning June 1 and ending July 31 measured at or near the mouth.

13. McKay Creek or its tributaries above river mile 15.5 (NE 1/4, Section 24, Township 2 North, Range 3 West) for flows of McKay Creek below 4 cubic feet per second for the period beginning August 1 and ending September 30, and 36 cubic feet per second for the period beginning November 16 and ending May 31 measured at or near river mile 15.5.

14. East Fork of McKay Creek or its tributaries above the mouth (SW 1/4, Section 18, Township 2 North, Range 2 West) for flows of East Fork of McKay Creek below 2 cubic feet per second for the period beginning August 1 and ending September 30 measured at or near the mouth.

15. McFee Creek or its tributaries above the confluence of Gulf Canyon Creek (SE 1/4, Section 18, Township 2 South, Range 2 West) for flows of McFee Creek below 2 cubic feet per second for the period beginning August 1 and ending September 30, and 12 cubic feet per second for the period beginning November 15 and ending May 31 measured at or near the confluence of McFee and Gulf Canyon Creeks.

16. The Tualatin River or its tributaries above USGS-State Engineer Gage No. 14-2075 (SW 1/4, Section 34, Township 2 South, Range 1 East) at West Linn, Oregon, in the amounts specified:

Month	Effective From May 25, 1966 For Natural Flows of the Tualatin River Below:	Effective From April 15, 1970 For Natural Flows of the Tualatin River Below:	As Adopted April 19, 1975 From Water Released From Henry Hagg Lake (Scoggins Reservoir) For Amounts Up To:	As Adopted April 19, 1975 From Total 1/ Water Released From Storage For Amounts Up To:
October	30 cfs	90 cfs 2/	15 cfs	250 cfs
November	30 cfs	110 cfs	250 cfs	
December	30 cfs		250 cfs	
January	30 cfs		250 cfs	
February	30 cfs		250 cfs	
March	30 cfs		250 cfs	
April	30 cfs		250 cfs	
May	30 cfs	85 cfs	250 cfs	
June	20 cfs	130 cfs 2/	20 cfs	250 cfs
July (1-15)	20 cfs	40 cfs 2/	75 cfs	250 cfs
July (16-31)	15 cfs	30 cfs 2/	75 cfs	250 cfs
August	15 cfs	30 cfs 2/	75 cfs	250 cfs
September	15 cfs	25 cfs 2/	60 cfs	250 cfs

1/ Includes water diverted through Oswego Canal as measured at USGS-State Engineer Gage No. 14-2070 (NW 1/4, Section 20, Township 2 South, Range 1 East) near Lake Oswego, Oregon.

2/ As modified April 19, 1975

The aforementioned flows will be measured at USGS-State Engineer Gage No. 14-2075 and those flows adopted in 1970 and 1975 shall be maintained to the mouth of the Tualatin River.

C. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and of attaining the highest and best use of the waters released from storage, no appropriation of water except for domestic or livestock uses or waters to be legally stored or legally released from storage shall be made or granted by any state agency or public corporation of the state for the waters of:

WILLAMETTE RIVER

The Willamette River or its tributaries above Willamette Falls at Oregon City for natural flows of the Willamette River below 1,500 cubic feet per second plus waters released from storage of up to 4,700 cubic feet per second measured at or near said Willamette Falls and maintained to the mouth.

CLACKAMAS SUBBASIN

1. Lowe Creek or its tributaries above the mouth (Section 19, Township 7 South, Range 8 East) for flows of Lowe Creek below 2 cubic feet per second for the period beginning July 1 and ending October 31, and 8 cubic feet per second for the period beginning November 1 and ending June 30 measured at or near the mouth.

2. Pinhead Creek or its tributaries above the mouth (Section 6, Township 7 South, Range 8 East) for flows of Pinhead Creek below 50 cubic feet per second for the period beginning June 1 and ending October 31, and 75 cubic feet per second for the period beginning November 1 and ending May 31 measured at or near the mouth.

3. The Clackamas River or its tributaries above USGS-Federal Power Commission Gage No. 14-2080 (SE 1/4, Section 26, Township 6 South, Range 7 East) at Big Bottom for flows of the Clackamas River below 150 cubic feet per second for the period beginning July 1 and ending September 15, and 240 cubic feet per second for the period beginning September 16 and ending June 30 measured at the aforementioned gage.

4. The Collawash River or its tributaries above the mouth (SE 1/4, Section 22, Township 6 South, Range 6 East) for flows of the Collawash River below 75 cubic feet per second for the period beginning July 16 and ending September 15, 250 cubic feet per second for the period beginning September 16 and ending May 31, and 200 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

5. East Fork Collawash River or its tributaries above the mouth (Section 6, Township 8 South, Range 7 East) for flows of East Fork Collawash River below 10 cubic feet per second for the period beginning August 1 and ending September 30 measured at or near the mouth.

6. Elk Lake Creek or its tributaries above the mouth (Section 6, Township 8 South, Range 7 East) for flows of Elk Lake Creek below 15 cubic feet per second for the period beginning August 1 and ending September 30 measured at or near the mouth.

7. Hot Springs Fork of the Collawash River or its tributaries above the mouth (SW 1/4, Section 3, Township 7 South, Range 6 East) for flows of Hot Springs Fork Collawash River below 15 cubic feet per second for the period beginning July 16 and

ending September 15, and 75 cubic feet per second for the period beginning September 16 and ending July 15 measured at or near the mouth.

8. Oak Grove Fork of the Clackamas River or its tributaries above the mouth (SE 1/4, Section 3, Township 6 South, Range 6 East) for flows of Oak Grove Fork below 10 cubic feet per second for the period beginning August 1 and ending September 30 measured at or near the mouth.

9. The Clackamas River or its tributaries above USGS-Federal Power Commission Gage No. 14-2095 (NE 1/4, Section 21, Township 5 South, Range 6 East) above Three Lynx, Oregon, for natural flows of the Clackamas River below 400 cubic feet per second for the period beginning July 1 and ending September 15 and 640 cubic feet per second for the period beginning September 16 and ending June 30 measured at the aforementioned gage and maintained to the mouth.

10. The Roaring River or its tributaries above the mouth (SE 1/4, Section 6, Township 5 South, Range 6 East) for flows of Roaring River below 40 cubic feet per second for the period beginning July 1 and ending October 15 and 100 cubic feet per second for the period beginning October 16 and ending June 30 measured at or near the mouth.

11. Fish Creek or its tributaries above the mouth (NE 1/4, Section 11, Township 5 South, Range 5 East) for flows of Fish Creek below 15 cubic feet per second for the period beginning July 1 and ending October 31, and 60 cubic feet per second for the

period beginning November 1 and ending June 30 measured at or near the mouth.

12. Fish Creek or its tributaries above the confluence of Wash Creek (SE 1/4, Section 3, Township 6 South, Range 5 East) for flows of Fish Creek below 3 cubic feet per second for the period beginning August 1 and ending September 30 measured at or near the confluence of Fish and Wash Creeks.

13. Wash Creek or its tributaries above the mouth (SE 1/4, Section 3, Township 6 South, Range 5 East) for flows of Wash Creek below 3 cubic feet per second for the period beginning July 16 and ending October 31, 25 cubic feet per second for the period beginning November 1 and ending June 15, and 10 cubic feet per second for the period beginning June 16 and ending July 15 measured at or near the mouth.

14. Eagle Creek or its tributaries above the mouth (SE 1/4, Section 36, Township 2 South, Range 3 East) for flows of Eagle Creek below 40 cubic feet per second for the period beginning July 16 and ending October 31, 125 cubic feet per second for the period beginning November 1 and ending May 31, and 100 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

15. North Fork Eagle Creek or its tributaries above the mouth (NW 1/4, Section 11, Township 3 South, Range 4 East) for flows of North Fork Eagle Creek below 10 cubic feet per second for the period beginning August 1 and ending October 31, 45 cubic feet per second for the period beginning November 1 and ending May 31, 30 cubic feet per second for the period beginning June

1 and ending June 30, and 20 cubic feet per second for the period beginning July 1 and ending July 31 measured at or near the mouth.

16. Deep Creek or its tributaries above the mouth (SW 1/4, Section 15, Township 2 South, Range 3 East for flows of Deep Creek below 10 cubic feet per second for the period beginning July 16 and ending October 31, 35 cubic feet per second for the period beginning November 1 and ending May 31, and 20 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

17. North Fork Deep Creek or its tributaries above the mouth (SW 1/4, Section 14, Township 2 South, Range 3 East) for flows of North Fork Deep Creek below 1 cubic foot per second for the period beginning August 1 and ending October 31, 20 cubic feet per second for the period beginning November 1 and ending May 31, and 3 cubic feet per second for the period beginning June 1 and ending July 31 measured at or near the mouth.

18. Tickle Creek or its tributaries above the mouth (SE 1/4, Section 13, Township 2 South, Range 3 East) for flows of Tickle Creek below 4 cubic feet per second for the period beginning July 1 and ending October 31, 30 cubic feet per second for the period beginning November 1 and ending May 31, and 6 cubic feet per second for the period beginning June 1 and ending June 30 measured at or near the mouth.

19. Clear Creek or its tributaries above the mouth (SW 1/4, Section 18, Township 2 South, Range 3 East) for flows of Clear Creek below 20 cubic feet per second for the period beginning August

1 and ending September 30, and 40 cubic feet per second for the period beginning June 1 and ending July 31 measured at or near the mouth.

20. Clear Creek or its tributaries above Viola, Oregon (NW 1/4, Section 23, Township 3 South, Range 3 East) for flows of Clear Creek below 15 cubic feet per second for the period beginning July 16 and ending September 30 and 25 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near Viola.

COLUMBIA SUBBASIN

1. Milton Creek or its tributaries above the confluence of Salmon Creek (SE 1/4, Section 35, Township 5 North, Range 2 West) for flows of Milton Creek below 25 cubic feet per second for the period beginning November 1 and ending April 30 measured at or near the confluence of Milton and Salmon Creeks.
2. Cox Creek or its tributaries above the mouth (SW 1/4, Section 1, Township 4 North, Range 2 West) for flows of Cox Creek below 6 cubic feet per second for the period beginning November 1 and ending April 30 measured at or near the mouth.
3. Salmon Creek or its tributaries above the mouth (SE 1/4, Section 35, Township 5 North, Range 2 West) for flows of Salmon Creek below 5 cubic feet per second for the period beginning November 1 and ending April 30 measured at or near the mouth.
4. North Scappoose Creek or its tributaries above the mouth (SE 1/4, Sectioin 1, Township 3 North, Range 2 West) for flows of North Scappoose Creek below 5 cubic feet per second for the period beginning July 16 and ending October 31, 40 cubic feet

per second for the period beginning November 1 and ending May 31, and 20 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

5. Alder Creek or its tributaries above the mouth (NW 1/4, Section 21, Township 4 North, Range 2 West) for flows of Alder Creek below 1 cubic foot per second for the period beginning July 1 and ending October 31, 8 cubic feet per second for the period beginning November 1 and ending May 31, and 3 cubic feet per second for the period beginning June 1 and ending June 30 measured at or near the mouth.

6. Cedar Creek or its tributaries above the mouth (SE 1/4, Section 18, Township 4 North, Range 2 West) for flows of Cedar Creek below 1 cubic foot per second for the period beginning July 1 and ending October 31, 6 cubic feet per second for the period beginning November 1 and ending May 31, and 3 cubic feet per second for the period beginning June 1 and ending June 30 measured at or near the mouth.

7. Chapman Creek (Lizzie Creek) or its tributaries above the mouth (SE 1/4, Section 13, Township 4 North, Range 3 West) for flows of Chapman Creek below 1 cubic foot per second for the period beginning July 1 and ending October 31, 6 cubic feet per second for the period beginning November 1 and ending May 31, and 3 cubic feet per second for the period beginning June 1 and ending June 30 measured at or near the mouth.

8. North Fork of North Scappoose Creek or its tributaries above the mouth (SE 1/4, Section 14, Township 4 North, Range 3 West) for flows of North Fork of North Scappoose Creek below 1 cubic

foot per second for the period beginning July 16 and ending October 31, 7 cubic feet per second for the period beginning November 1 and ending May 31, and 3 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

9. Sierkes Creek (Deep Creek) or its tributaries above the mouth (NE 1/4, Section 34, Township 4 North, Range 2 West) for flows of Sierkes Creek below 0.5 cubic foot per second for the period beginning June 16 and ending October 31, and 7 cubic feet per second for the period beginning November 1 and ending June 15 measured at or near the mouth.

10. South Fork of North Scappoose Creek or its tributaries above the mouth (SE 1/4, Section 14, Township 4 North, Range 3 West) for flows of South Fork of North Scappoose Creek below 1 cubic foot per second for the period beginning July 1 and ending October 31, 8 cubic feet per second for the period beginning November 1 and ending May 31, and 4 cubic feet per second for the period beginning June 1 and ending June 30 measured at or near the mouth.

11. South Scappoose Creek or its tributaries above the confluence of Raymond Creek (SE 1/4, Section 15, Township 3 North, Range 2 West) for flows of South Scappoose Creek below 5 cubic feet per second for the period beginning July 1 and ending October 31, 25 cubic feet per second for the period beginning November 1 and ending May 31, and 12 cubic feet per second for the period beginning June 1 and ending June 30 measured at or near the confluence of South Scappoose and Raymond Creeks.

12. Gourlay Creek or its tributaries above the mouth (NE 1/4, Section 17, Township 3 North, Range 2 West) for flows of Gourlay Creek below 0.5 cubic foot per second for the period beginning July 16 and ending October 31, 10 cubic feet per second for the period beginning November 1 and ending May 31, and 2 cubic feet per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

13. Raymond Creek or its tributaries above the mouth (SE 1/4, Section 15, Township 3 North, Range 2 West) for flows of Raymond Creek below 0.5 cubic foot per second for the period beginning July 16 and ending October 31, 8 cubic feet per second for the period beginning November 1 and ending May 31, and 1 cubic foot per second for the period beginning June 1 and ending July 15 measured at or near the mouth.

D. Applications for the use of the waters of the Lower Willamette Basin shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

E. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses.

F. Rights to use of water for power purposes granted by any state agency shall be issued only on condition that the project operation

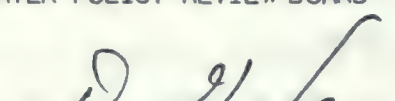
shall be compatible with other beneficial uses.

G. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

H. Applications for the use of water for any purposes contrary to classifications specified in the basin program shall not be accepted or granted except as provided by law. The Director shall notify the Board and other interested individuals or agencies of the intent to accept an application for use in conflict with the adopted program in accordance with ORS 536.380 if the proposed use will not have a significant impact on any other water use as provided in Section A through C of this program.

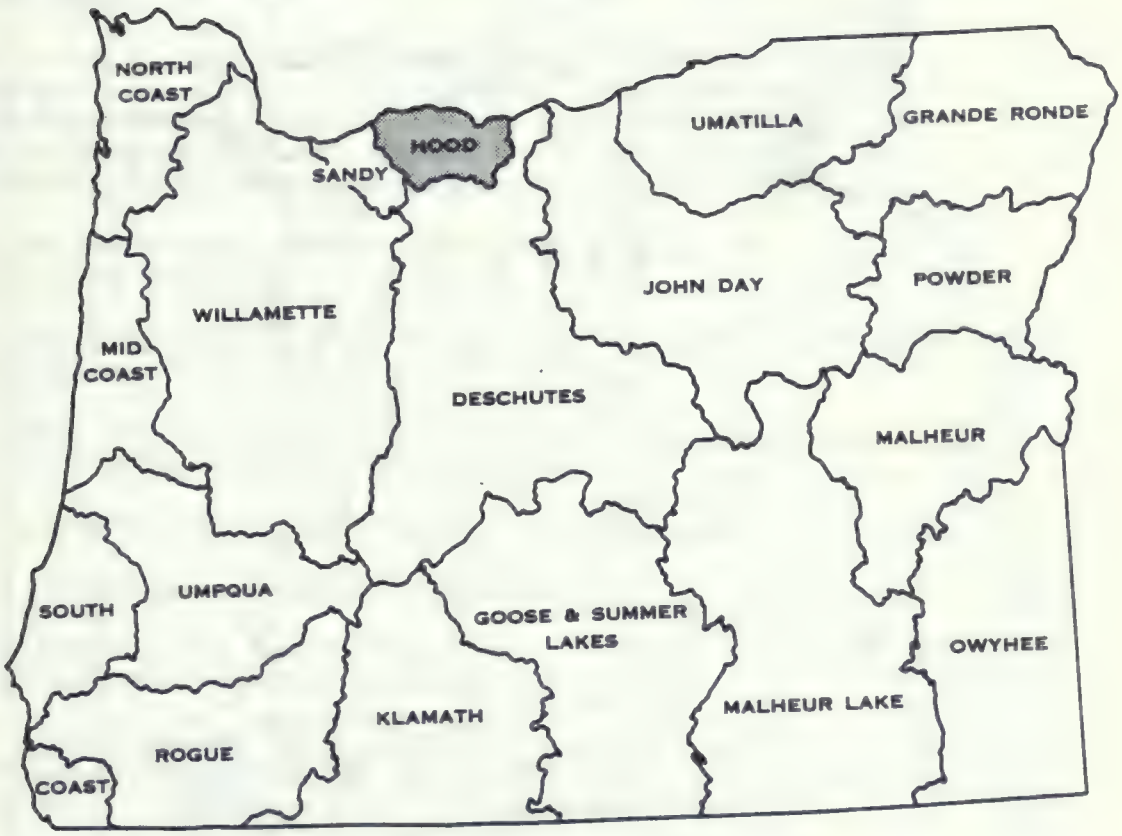
Done and dated this 9th day of December, 1980.

WATER POLICY REVIEW BOARD

By 
DONEL J. LANE, Chairman

1767A

HOOD BASIN


NORTH COAST
HOOD
SANDY
UMATILLA
GRANDE RONDE
JOHN DAY
POWDER
WILLAMETTE
MID COAST
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SOUTH
UMPQUA
GOOSE & SUMMER LAKES
OWYHEE
KLAMATH
MALHEUR LAKE
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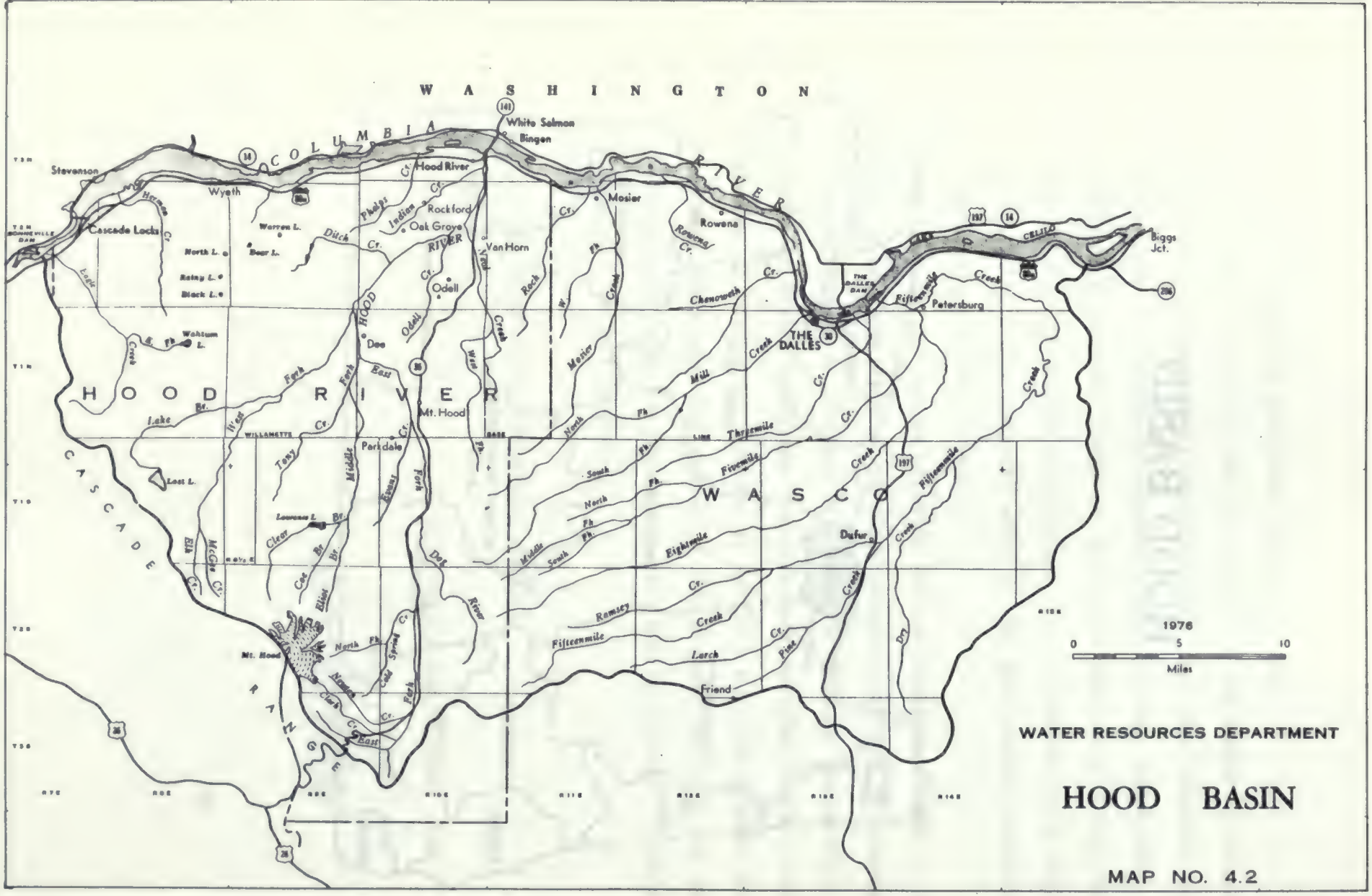
WASHINGTON
COLUMBIA
RIVER
White Salmon
Bingen
Stevenson
Hood River
Wyeth
Cascade Locks
Mosier
Rowena
Biggs Jct.
Rockford
Oak Grove
Van Horn
Odell
Dee
Parkdale
Mt. Hood
Petersburg
THE DALLES
HOOD RIVER
WASCO
CASCADE RANGE
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WATER RESOURCES DEPARTMENT
HOOD BASIN
MAP NO. 4.2

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Hood Basin	)))))	Hood Basin April 4, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Hood Basin as delineated on State Water Resources Board Map, File 4.6;

WHEREAS results of this study have been published in the State Water Resources Board Report, Hood Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Hood Basin;

WHEREAS as a result of said study the following findings and conclusions were reached by this board pertaining to the Hood Area of the Hood Basin;

1. There is enough surface water on a critical year basis to meet existing and contemplated needs for all beneficial uses.

2. An undetermined quantity of lower quality ground water is available.

3. Land resources are sufficient to increase the irrigated acreage by 6,200 acres.

4. Diversion of the surplus Hood River Valley water to adjacent areas of need appears to be impractical due to high lifts involved.

5. Augmentation of water supply during low flow periods can come through storage of surplus runoff, development of ground water supplies, and more efficient use of presently appropriated waters.

6. Depletions on some streams are such that the simultaneous use of major portions of existing rights could result in zero flows during critical low flow periods.

7. Further clarification of water rights both as to quantity of water and irrigated area is needed in the Hood River Valley.

* Modifies Hood Basin Program dated March 30, 1966 and January 10, 1980.

8. The waters of the streams forming waterfalls near the Columbia River Highway have been withdrawn from appropriation, condemnation, diversion or interruption by statute under ORS Chapter 538.

9. Domestic, industrial, recreation, mining, livestock, and wildlife uses, while important, represent comparatively small quantities of water in existing and contemplated future needs.

10. Municipal use, mainly from springs, is a small, but important consumptive use when determining water needs.

11. Irrigation accounts for over 95 percent of the consumptively used water and will continue to be the major consumptive use.

12. Efficiency of water use could be improved by extensive rehabilitation of transmission and distribution facilities.

13. Development of additional hydroelectric power appears economically and physically feasible.

14. Recreational use of inland waters including the Columbia River reservoir pools is of major importance and is associated primarily with sport fishing, boating, swimming, sightseeing, and waterfowl hunting.

15. There are several natural and manmade lakes available for water-based recreation within the basin.

16. Use of the Hood River and gorge headwater streams by fish life is of importance to the Hood Area and the state. Development proposals on the Hood River and other major streams should consider anadromous fish runs.

17. Restrictions on further appropriation of natural streamflow would materially aid in maintaining minimum flows to support aquatic life and recreation on the main stem, Middle Fork, and West Fork of Hood River.

18. Until studies have been completed to determine minimum flows desirable for fish passage on the main stem of Hood River between the Powerdale Diversion and the point of power return flows, it appears that the minimum flow should be established at 45 cubic feet per second which quantity has been available during critical low flow periods and that upon completion of the studies, this quantity should be reevaluated. In the interim period, applications to appropriate water affecting lower Hood River flows should be screened by the Board to prevent further flow depletions.

19. Pollution of surface and ground water is localized, intermittent in occurrence and is only critical in a few urban and industrial areas.

20. Serious damage, caused by flooding and erosion, frequently occurs along major streams fed by Mt. Hood glaciers and in cropped areas.

21. Drainage problems exist in a few urban and rural areas.

22. Physical and economic factors justify limited-purpose use of certain waters.

23. The maximum beneficial use of the waters of the Hood Area is for domestic and livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life purposes.

WHEREAS as a result of said study the following findings and conclusions were reached by this board pertaining to the Wasco Area of the Hood Basin:

1. Total quantities of surface water are inadequate to meet all contemplated future needs for water.

2. The ground water resource is inadequate in most area to meet existing needs.

3. The area underlain by The Dalles and Threemile Ground Water Pools has been declared a critical ground water area by the State Engineer.

4. Coordinated development of surface and ground water is required for progressive, stable growth.

5. Augmentation of water supply during low flow periods can come through storage of surplus runoff, management of ground water supplies to include artificial recharge where feasible, and more efficient use of presently appropriated waters.

6. An adjudication decree provides for the diversion of all Dog River water at the present diversion point from the Hood Area to the Mill Creek drainage basin for municipal use, but does not fully protect flows existing above the diversion point.

7. Maximum utilization of water requires further clarification of water rights both as to quantity of water and irrigated area in the Wasco Area.

8. Domestic, industrial, recreation, livestock, and wildlife uses, while important, represent comparatively small quantities of water in existing and contemplated future needs.

9. Municipal use, mainly from Mill Creek and ground water, is an important and growing consumptive use when determining water needs.

10. Water requirements for suitable irrigable areas greatly exceed presently available water supplies although there are sufficient water resources that could be made available to more than treble the irrigated acreage to 21,500.

11. The efficiency of water use could be improved by extensive rehabilitation of irrigation facilities.

12. Use of water for hydroelectric power is nonexistent at present and the physical and economic potential is limited.

13. Recreational use of inland waters including the Columbia River reservoir pools is of considerable importance to the area and is associated primarily with sport fishing, boating, swimming, and waterfowl hunting.

14. Use of the basin's headwater streams by resident fish life is of importance to the basin.

15. Restrictions on further appropriations of natural streamflow would not materially aid in maintaining minimum flows because of existing over-appropriation during the low flow season.

16. Pollution of surface and ground water is localized and intermittent in occurrence.

17. Serious damage, caused by flooding and erosion, is an annual occurrence along all major streams in cropped areas.

18. No serious drainage problems presently exist.

19. Physical and economic factors justify limited-purpose use of certain waters.

20. The highest and best use of the waters of the Wasco Area is for domestic and livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life purposes.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with ORS 536.300(2) pertaining to the water resources of the Hood Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Hood Basin and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and the waters of the Hood Basin are hereby so classified with the following exception:

> The maximum economic development of this state, the attainment of the highest and best use of the waters of Dog River above its point of diversion at State Engineer - U.S. Geological Survey Gage 1134, as shown on State Water Resources Board Map 4.6, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for municipal use and the waters of Dog River above its point of diversion at State Engineer - U.S. Geological Survey Gage 1134, as shown on State Water Resources Board Map 4.6, are hereby so classified.

B. The maximum economic development of this state and the attainment of the higest and best use of the waters of the natural lakes of the Hood Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development not to exceed 7 1/2 theoretical horsepower, recreation, wildlife, and fish life uses and the waters of natural lakes of the basin are hereby so classified.

C. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic, livestock or municipal uses or waters to be legally stored or legally released from storage shall be made or granted by a state agency or public corporation of the state for the waters of:

1. Hood River above Powerdale Diversion Dam for flows below 45 cubic feet per second measured at said dam and maintained to the mouth of Hood River.

2. West Fork Hood River and its tributaries above U.S. Geological Survey - State Engineer Gage 1185 one-half mile above the mouth for flows of below 100 cubic feet per second measured at said gage and maintained to the mouth of West Fork Hood River.

3. Middle Fork Hood River and its tributaries above its mouth for flows of below 10 cubic feet per second measured at said point.

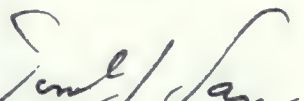
D. Applications for the use of these specified waters of the Hood Basin shall not be accepted by any state agency for any other use and the granting of applications for such other uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

E. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

F. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give cognizance to the multiple-purpose concept.

Done and dated this 4th day of April 1981.

WATER POLICY REVIEW BOARD

By 

Donel J. Lane, Chairman

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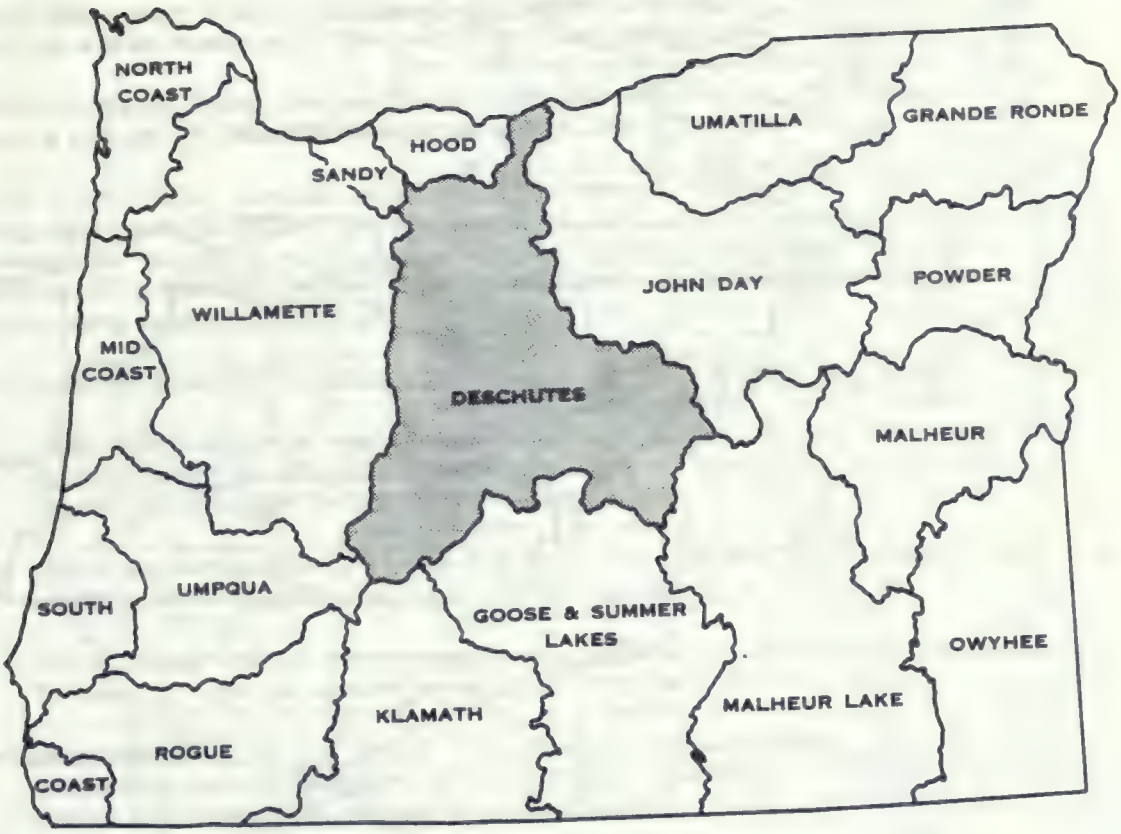
DESCHUTES RIVER BASIN



WASHINGTON
COLUMBIA RIVER
Hood River
Cascade Locks
THE DALLES
Moody
Biggs
Rufus
Wasco
Arlington
Lake Umatilla
HOOD RIVER
SHERMAN
Dufur
Mora
Grass Valley
Mt. Hood
Tygh Valley
Sherar
Kent
Maupin
E. Maupin
Wapenitia
Bakeoven
Condon
Fossil
WASCO
WARM SPRINGS
INDIAN RESERVATION
Simnasho
Dixon
Shaniko
Antelope
Kaskela
Hot Springs
South Junction
Willowdale
Ashwood
WHEELER
JEFFERSON
Madras
Metolius
Haycreek
Mitchell
OCHOCO MOUNTAINS
Camp Sherman
Culver
Suttle L.
Sisters
Redmond
Powell Butte
Ochoco Res.
Prineville
CROOK
GRANT
Plainview
Tumalo
Three Sisters
BEND
Alfalfa
Roberts
Post
Paulina
Elk Lake
DESCHUTES
Sunriver
Millican
Brothers
Crane Prairie Res.
Wickiup Reservoir
East Lake
Lapine
HARNEY
Hampton
Davis Lake
Odell L.
Crescent Lake
Gilchrist
KLAMATH
Mowich
Paunina
Chemult
LAKE
1976
0 10 20
Miles
WATER RESOURCES DEPARTMENT
DESCHUTES BASIN
MAP NO. 5.2

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Deschutes River Basin	)))))	Deschutes River Basin April 4, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 completed a study of the Deschutes River Basin;

WHEREAS results of that study were published in State Water Resources Board Report, Deschutes River Basin, dated January 1961;

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Deschutes River Basin;

WHEREAS the Water Policy Review Board under the authority of 536.300 and 536.340 has undertaken a restudy of the water resources of the Deschutes River Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of said study the following findings have been reached by this Board:

1. The total quantity of water is sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. Flows are not sufficient on many streams during the summer months of average water years to supply existing and future demands.

3. Simultaneous use of a major portion of existing consumptive rights results in flows at or near the zero level on some streams during the summer months.

4. Augmentation of the water resources can be achieved through storage of surplus winter and spring runoff; reduction of storage, channel, and transmission losses; and more efficient use of presently appropriated water.

5. There are physically feasible storage sites in the basin.

6. Unappropriated waters of the Deschutes River and its tributaries above Bend, Tumalo Creek above Columbia-Southern Canal, Crooked River, Ochoco Creek and White River and its tributaries, have been withdrawn for special uses.

* Modifies Deschutes Basin Programs dated February 20, 1962, May 24, 1962, April 3, 1964, May 26, 1967, July 7, 1978, January 10, 1980 and April 1, 1980.

7. The established limited purposes of existing storage developments restrict multiple beneficial use of the water resources.

8. The existence of ground water has been established in certain sections of the basin, but quantities have not been determined.

9. Domestic, livestock, and municipal uses of water, while important, represent minor quantities in existing and contemplated future water use.

10. Irrigation is and will continue to be the major consumptive water use in the basin.

11. Adequately irrigated agricultural lands represent only a small portion of the total irrigated area.

12. The existing irrigated acreage could be more than doubled providing an adequate supply of water were available.

13. The basin has substantial potential for power development.

14. The basin has potential for industrial development.

15. Sufficient water will not be available in many locations for major water-using industries without provision for seasonal storage, acquisition of existing rights, or development of ground water resources.

16. The use of water for mining purposes is slight and is not expected to increase materially in the foreseeable future.

17. Recreation is a major use of water and an important factor in the economy of the basin.

18. There is an abundance of reservoirs, lakes and streams available for water-based recreation in the western portion of the basin.

19. There is potential for more extensive use of existing waters for recreation purposes.

20. In the area of intermittent streams, reservoirs provide water-based recreation.

21. Water consumption by wildlife does not represent a significant quantity.

22. A major conflict exists between irrigation and fish life use of water.

23. A major conflict exists between power and fish life use of water.

24. Reduction of present reservoir and stream level fluctuations, maintenance of minimum reservoir levels and improved streamflows would enhance fish life and recreation.

25. Recommended base flows suggested by fisheries agencies are substantially higher in many locations than flow levels that can be obtained during average water years under current stream regimen and existing water rights and priorities.

26. Storage and scheduled releases of excess winter and spring runoff, reduction of channel and transmission losses, or acquisition of some existing rights, would be necessary to obtain the flows recommended by fisheries agencies. The economic feasibility of such measures has not been determined.

27. Pollution of surface and ground water is not a significant problem at present.

28. Floods, drainage and streambank erosion are not major problems.

29. Major foreseeable quantitative uses of water in the Deschutes River Basin will be for irrigation, power, recreation, and fish life uses.

30. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

31. Establishment of restrictions on further appropriations would prevent an increase in depletion potential on some streams which would aid in maintaining minimum flows.

32. Where streams are seasonally overappropriated, the establishment of restrictive actions would have no immediate physicial effect until additional flows become available.

33. Criterial for determination of desirable base flows commensurate with all beneficial uses have not been developed.

34. It is imperative that single-purpose development of available sites does not preclude optimum utilization of the resource.

35. Certain major rivers, or river sections, and numerous lakes, minor streams, and creeks are by nature of their physiography, location, land ownership, or economic potential, available only for limited resource uses.

36. Physical features, degree of economic development, and water use requirements vary from sub-basin to sub-basin.

NOW THEREFORE BE IT RESOLVED that for reason of variance in physical features, degree of economic development, and water use requirements from sub-basin to sub-basin, the Board adopts the following findings and issues program statements for each of the sub-basins of the Deschutes River Basin.

UPPER DESCHUTES RIVER

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Upper Deschutes River Basin as delineated on State Water Resources Board Map, File 5.7014;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of said study the following findings have been reached by this Board:

1. The total quantity of water is sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. There is not enough water legally available on a critical year basis to meet existing and contemplated consumptive needs within this basin.

3. Maldistribution exists with regard to physical location and with respect to availability during time of need.

4. Many streams do not provide enough flow for present nonconsumptive public uses in periods of relatively low as well as critical flow.

5. Augmentation of the water resources in periods of need would require storage of surplus runoff.

6. There are physically feasible storage sites in the basin.

7. The existence of ground water has been established in certain sections of the basin, but quantities have not been determined.

8. All unappropriated waters of the Deschutes River and its tributaries above Bend have been withdrawn by the State Engineer for domestic, irrigation and power purposes.

9. A major portion of the withdrawn waters has been appropriated.

10. There is need to insure water for domestic, livestock, and municipal uses which, while small, are of benefit to the state.

11. Irrigation use of water is small in this basin and is not expected to increase materially in the foreseeable future.

12. Substantial quantities of water have been appropriated for irrigation use in downstream basins.

13. Power development appears to be economically and physically feasible.

14. There is limited potential for industrial use of water.

15. There are no existing water rights for mining operations in the basin. Potential for such use of water appears to be minor.

16. The basin has potential for expanded recreation use of water. The natural lakes and reservoirs consititute valuable recreation assets.

17. Water consumption by wildlife does not represent a significant quantity.

18. There are no anadromous fish in the basin, but resident fish constitute an important asset of the state.

19. There is potential for development of anadromous fish, but this cannot be achieved without the improvement of fish passage and low flow conditions.

20. Conflicts exist between fish life and irrigation uses of water.

21. Pollution of surface and ground water is not a significant problem.

22. Drainage and reclamation of drained lands are not significant factors in present and contemplated water use.

23. Flood problems are minor.

24. Utilization of flows to minimize pollution should not be permitted if such use interferes with the multiple-purpose concept.

25. Certain lakes are, by nature of their physiography, location, land ownership, or economic potential available only for limited resource use.

26. The maximum beneficial use of the waters of the Upper Deschutes River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Upper Deschutes River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Upper Deschutes River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the Upper Deschutes River Basin are hereby so classified with the following exception:

The maximum economic development of this state, the attainment of the highest and best use of the waters of the natural lakes of the Upper Deschutes River Basin, except for Crescent Lake, and the attainment of an integrated and coordinated program for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development not to exceed 7 1/2 theoretical horsepower, recreation, wildlife and fish life uses and the waters of the natural lakes, Upper Deschutes River Basin, except for Crescent Lake, are hereby so classified.

B. Applications for the use of the waters of the Upper Deschutes River Basin shall not be accepted by any state agency for any other use and the granting of applications for such other uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

C. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on the condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

D. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

MIDDLE DESCHUTES RIVER

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Middle Deschutes River Basin as delineated on State Water Resources Board Map, File 5.7014.

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of said study the following findings have been reached by this Board:

1. The total quantity of water is sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water in this basin with the exception of utilization of water to minimize pollution.

2. Maldistribution exists with regard to physical location and with respect to availability during time of need.

3. Simultaneous use of a major portion of existing consumptive rights results in flows at or near the zero level on many streams during the summer months.

4. The existence of ground water has been established in certain sections of the basin, but quantities have not been determined.

5. There are legislative restrictions on the use of waters of Tumalo Creek.

6. There is need to insure water for domestic, livestock and municipal uses which, while small, are of benefit to the state.

7. Irrigation is and will continue to be the major consumptive use of water.

8. Natural flow and present degree of regulation are insufficient to satisfy existing irrigation requirements.

9. Water supply will be a limiting factor in developing potential irrigable land.

10. Augmentation of the water resources in periods of need can be achieved through storage of surplus winter and spring runoff; reduction of storage, channel, and transmission losses; and more efficient use of presently-appropriated water.

11. There are physically-feasible storage sites.

12. There is substantial potential for power development.

13. The development of the power potential could seriously conflict with recreation and fish life values.

14. There is considerable potential for industrial use of water.

15. Storage and scheduled releases of surplus winter and spring runoff; reduction of channel and transmission losses; or acquisition of some existing rights, would be necessary to obtain the waters needed by major water-using industries.

16. Use of water for mining purposes is slight and is not expected to increase materially in the foreseeable future.

17. Recreation is a major use of water.

18. The Metolius River is superior as a natural recreation value.

19. Water consumption by wildlife does not represent a significant quantity.

20. There is inadequate streamflow for fishery requirements.

21. Base flows recommended by fisheries agencies are substantially higher in many locations than flow levels that can be obtained during average water years under current stream regimen and existing water rights and priorities.

22. Pollution of surface and ground water is not a significant problem.

23. Major foreseeable quantitative uses of water will be for irrigation, power, recreation and fish life.

24. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

25. Maintenance of minimum perennial streamflows would generally benefit recreation, wildlife and fish life.

26. Criteria for determination of desirable base flows commensurate with all beneficial uses of water have not been developed.

27. Certain river sections, minor streams, creeks and lakes are by nature of their physiography, location, land ownership, or economic potential, available only for limited resource use.

28. The maximum beneficial use of the waters of the Middle Deschutes River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Middle Deschutes River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Middle Deschutes River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the Middle Deschutes River Basin are hereby so classified with the following exceptions:

1. The State Water Resources Board program, Lower Main Stem Deschutes River, adopted April 3, 1964, as modified by the Water Policy Review Board.

2. The maximum economic development of this state, the attainment of the highest and best use of the waters of the main stem, Metolius River, above river mile 13.0, and the attainment of an integrated and coordinated program for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the main stem, Metolius River, above river mile 13.0, are hereby so classified.

3. Further, no out-of-basin diversions of the waters of the main stem Metolius River, above river mile 13.0, shall be permitted for any use.

4. No further appropriations except for domestic or livestock uses shall be permitted for waters of the main stem Deschutes River, from the head of Lake Billy Chinook near river mile 120 to the North Canal Dam near river mile 165.

5. The maximum economic development of this state, the attainment of the highest and best use of the waters of the natural lakes of the Middle Deschutes River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development not to exceed 7 1/2 theoretical horsepower, recreation, wildlife and fish life uses.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic or livestock uses shall be made or granted by any state agency or public corporation of the state for the waters of Lake Creek or its tributaries above the confluence of Lake Creek with the Metolius River for flows of Lake Creek below 20 cubic feet per second measured at the mouth of Lake Creek except that this limitation shall not apply to waters legally stored or legally released from storage.

C. Applications for the use of the waters of the Middle Deschutes River Basin shall not be accepted by any state agency for any other use and the granting of applications for such other uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudical to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

LOWER DESCHUTES RIVER

WHEREAS the State Water Resources Board under the authority of ORS 536.300 studied the Lower Deschutes River Basin as delineated on State Water Resources Board Map File 5.7014;

WHEREAS the Water Policy Review Board under the authority of ORS 536.300 and 536.340 has undertaken a restudy of the Lower Deschutes Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation and flood control; and

WHEREAS as a result of said study the following findings have been reached by this Board for the tributaries of the Deschutes River within the Lower Deschutes River Basin:

1. The total quantity of water is sufficient on an average year basis to satisfy existing needs and uses of water with the exception of utilization of water to minimize pollution.

2. Maldistribution exists with regard to physical location and with respect to availability during time of need.

3. Many streams do not provide enough flow for nonconsumptive public uses at present in periods of relatively low as well as critical flow.

4. Simultaneous use of a major portion of existing consumptive rights results in flows at or near the zero level on many streams during the summer months.

5. Flows, unless augmented by storage, would not be sufficient on most streams during the summer months to supply future consumptive and nonconsumptive demands.

6. The existence of ground water has been established in certain sections of the basin, but quantities have not been determined.

7. All unappropriated waters of White River and tributaries have been withdrawn by the State Engineer for special uses.

8. There is need to insure quantities of water for domestic, livestock, and municipal uses which, while small, are of benefit to the state.

9. Irrigation is and will continue to be the major consumptive use of water.

10. Potential exists for the development of the agricultural economy through expanded irrigation.

11. The unavailability of dependable supplies of adequate water in the future would be a restriction on the development of the agricultural potential of the basin.

12. Power development appears to be economically and physically feasible.

13. There is limited potential for industrial use of water.

14. Use of water for mining purposes is slight and is not expected to increase materially in the foreseeable future.

15. Recreation is an important use of water in the basin.

16. Water consumption by wildlife does not represent a significant quantity.

17. Full development of the anadromous fishery potential cannot be achieved without the improvement of fish passage and low flow conditions.

18. Material improvement of minimum flows for fish life cannot be achieved without the development of surface water storage.

19. Pollution of surface and ground water is not a significant problem.

20. Major foreseeable quantitative uses of water of the Lower Deschutes Basin will be for irrigation, recreation, and fish life.

21. Drainage and reclamation of drained lands are not significant factors in present and contemplated water use.

22. Limited flood problems exist, mainly on the eastern tributaries of the Deschutes River.

23. There are physically-feasible storage sites within the basin.

24. Small reservoirs on minor tributaries could reduce flash floods and streambank erosion and provide late season irrigation water.

25. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

26. Maintenance of minimum perennial streamflows would be in the public interest.

27. Certain lakes are by nature of their physiography, location, land ownership, or economic potential available only for limited resource use.

28. Criteria for determination of desirable base flows commensurate with all beneficial uses of water have not been developed, although information is available on flow requirements for aquatic life.

29. The maximum benefical use of the waters of the tributaries of the Deschutes River within the Lower Deschutes Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Lower Deschutes River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Lower Deschutes River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the Lower Deschutes River Basin are hereby so classified with the following exceptions:

1. The State Water Resources Board program, Lower Main Stem Deschutes River, adopted April 3, 1964, as modified by the Water Policy Review Board.

2. The waters of Boulder Lake in Hood River and Wasco Counties are classified only for domestic and livestock uses; power development not to exceed 7 1/2 theoretical horsepower; recreation, wildlife and fish life uses; and irrigation not to exceed 100 acre-feet annually from water stored in the lake.

3. The maximum economic development of this state, the attainment of the highest and best use of the waters of the other natural lakes of the Lower Deschutes River Basin, and the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development not to exceed 7 1/2 theoretical horsepower, recreation, wildlife, and fish life uses and the waters of the natural lakes of the Lower Deschutes River Basin are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic or livestock uses shall be made or granted by any state agency or public corporation of the state for the waters of the White River or its tributaries above the confluence of White River with the Deschutes River for flows of the White River below the following specified flows, except that this limitation shall not apply to waters legally stored or legally released from storage.

Measured at USGS gage 14101400 and maintained to the confluence of the White River and Deschutes River.

(Cubic Feet per Second)

January	60
February 1 - 15	60
16 - 29	100
March	145
April	145
May	145
June	100
July	60
August	60
September	60
October	60
November	60
December	60

C. Applications for the use of the waters of the Lower Deschutes River Basin shall not be accepted by any state agency for any other use and the granting of applications for such other uses is declared to be prejudicial to the public interest and the granting of applications for such uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give cognizance to the multiple-purpose concept.

DESCHUTES - UPPER CROOKED RIVER

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Deschutes - Upper Crooked River Basin as delineated on State Water Resources Board Map, File 5.7014;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of said study the following findings have been reached by this Board:

1. The total quantity of water is sufficient on an average year basis to satisfy all existing rights to water in this basin.

2. There is not enough water on a critical year basis to meet existing consumptive needs.

3. Maldistribution exists with regard to physical location and with respect to availability during time of need.

4. Simultaneous use of a major portion of existing consumptive rights results in flows at or near the zero level on many streams during the summer months.

5. Most streams do not provide enough flow for nonconsumptive public uses at present in periods of relatively low as well as critical flow.

6. The existence of ground water has been established in certain sections of the basin, but quantities have not been determined.

7. There is need to insure quantities of water for domestic, livestock, municipal and mining uses, which, while small, are of benefit to the state.

8. There are no municipal water systems in the basin.

9. Irrigation is and will continue to be the major consumptive use of water.

10. Most irrigated lands in the basin do not receive an adequate supply of water.

11. Substantially more than the average annual yield of the Upper Crooked River Basin has been withdrawn by the State Engineer for irrigation purposes.

12. Power development appears to be economically and physically feasible.

13. There is limited potential for industrial use of water.

14. Water-based recreation will become a more significant use of water in this basin.

15. Water consumption by wildlife does not represent a significant quantity.

16. Game fish populations are limited because of extreme low flows, high water temperatures, and extensive populations of rough fish.

17. Pollution of surface and ground water is not a significant problem.

18. Drainage and reclamation of drained lands are not significant factors in present and contemplated water use.

19. Flood problems exist mainly on the main stem of Crooked River.

20. There are physically-feasible storage sites within the basin.

21. Small reservoirs on minor tributaries could reduce flash floods and streambank erosion and provide late season irrigation water.

22. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

23. Criteria for determination of desirable base flows commensurate with all beneficial uses of water have not been developed.

24. The maximum beneficial use of the waters of the Upper Crooked River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Deschutes - Upper Crooked River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Deschutes - Upper Crooked River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the Deschutes - Upper Crooked River Basin are hereby so classified.

B. Applications for the use of the waters of the Deschutes - Upper Crooked River Basin shall not be accepted by any state agency for any other use and the granting of applications for such other uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

C. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

D. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

DESCHUTES - LOWER CROOKED RIVER

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Deschutes - Lower Crooked River Basin as delineated on State Water Resources Board Map, File 5.7014;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of said study the following findings have been reached by this Board:

1. The total quantity of water is sufficient on an average year basis to satisfy all existing and contemplated consumptive needs and uses of water.

2. There are streams within the basin whose average annual yield is not sufficient to satisfy existing rights.

3. Maldistribution exists with regard to physical location and with respect to availability during time of need.

4. Simultaneous use of a major portion of existing consumptive rights results in flows at or near the zero level on many streams during the summer months.

5. Most streams in the basin do not provide enough flow for nonconsumptive public uses at present in periods of relatively low as well as critical flow.

6. The existence of ground water has been established in certain sections of the basin, but quantities have not been determined.

7. There is need to insure water for domestic, livestock, municipal and mining uses which, while small, are of benefit to the state.

8. Irrigation is and will continue to be the major consumptive use of water.

9. There is additional potential for irrigation use of water.

10. Power development appears to be economically and physically feasible.

11. There is potential for industrial use of water.

12. Sufficient water will not be available in many locations for major water-using industries without the provision of seasonal storage.

13. Reservoirs will provide a major portion of water-based recreation.

14. The waters of the Crooked River, including Opal Springs, from river mile 6.5 to river mile 18.0, are a valuable source of municipal, irrigation, and industrial water.

15. Little potential for enhancement of fish life exists and is dependent upon securing adequate streamflow.

16. Increases of population and the need to serve presently unsewered areas, will require municipal sewerage works to be expanded.

17. Limited flood problems exist.

18. A coordinated plan of operation of Ochoco and Prineville Reservoirs will materially alleviate flood damages in the Prineville Valley.

19. There are physically-feasible storage sites within the basin.

20. Small reservoirs on minor tributaries could reduce flash floods and streambank erosion and provide late season irrigation water.

21. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

22. Certain river sections, minor streams and creeks are by nature of their physiography, location, land ownership, or economic potential available only for limited resource use.

23. Criteria for determination of desirable base flows commensurate with all beneficial uses of water have not been developed.

24. The maximum beneficial use of the waters of the Deschutes - Lower Crooked River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Deschutes - Lower Crooked River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Deschutes - Lower Crooked River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the Deschutes - Lower Crooked River Basin are hereby so classified with the following exceptions:

1. The State Water Resources Board program, Lower Main Stem Deschutes River, adopted April 3, 1964, as modified by the Water Policy Review Board.

2. No further appropriations of water except for domestic or livestock uses shall be made or granted by any state agency for the waters of Ochoco Creek and its tributaries.

B. Applications for the use of the waters of the Deschutes - Lower Crooked River Basin shall not be accepted by any state agency for any other use and the granting of applications for such uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

C. Rights to use water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

D. Structures or works for the utilization of the water in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

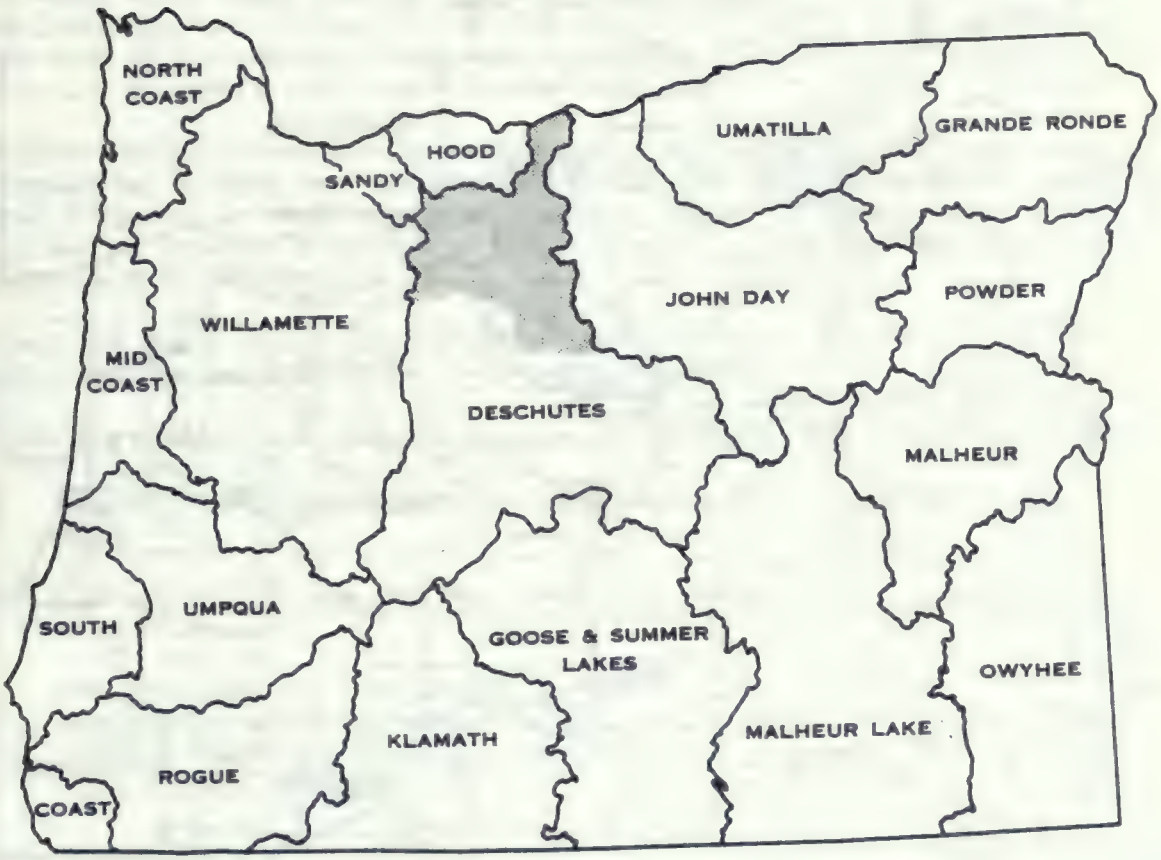
Done and dated this 4th day of April, 1981.

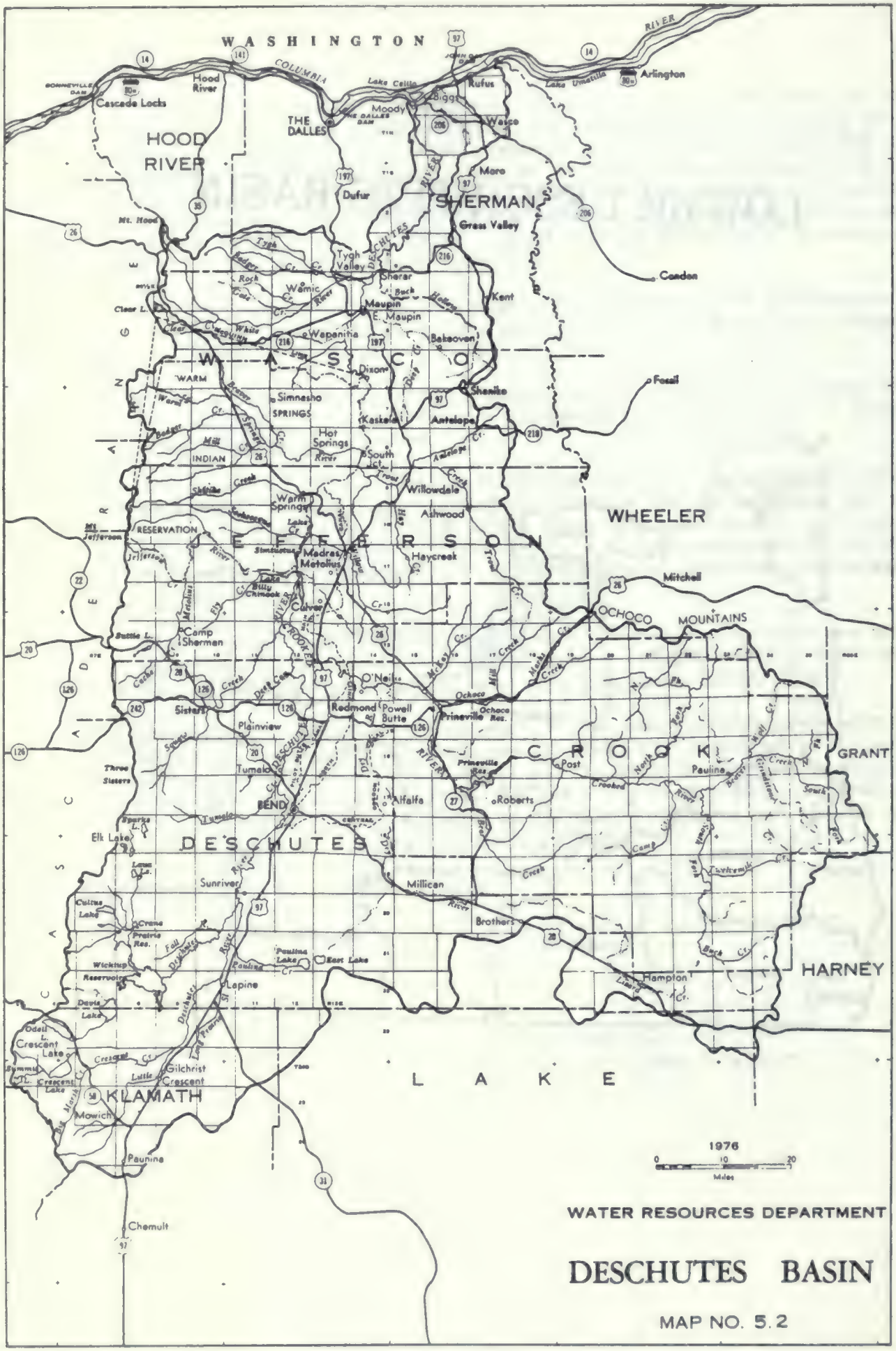
WATER POLICY REVIEW BOARD

By _____
Donel J. Lane, Chairman

4929A

LOWER DESCHUTES BASIN

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Dufur
Moro
Grass Valley
Tygh Valley
Condon
Mt. Hood
Wamic
Maupin
E. Maupin
Kent
Wapenitia
Bakeoven
WASCO
Dixonville
Shaniko
Fossil
WARM SPRINGS
INDIAN RESERVATION
Simnasho
Kaskela
Antelope
Hot Springs
South
Willowdale
Ashwood
WHEELER
JEFFERSON
Madras
Metolius
Haycreek
Mitchell
OCHOCO MOUNTAINS
Camp Sherman
Culver
O'Neil
Redmond
Powell Butte
Ochoco
Prineville Res.
Sisters
Plainview
CROOK
GRANT
Post
Pauline
Three Sisters
Tumalo
BEND
Alfalfa
Roberts
Elk Lake
DESCHUTES
Sunriver
Millican
Brothers
Crane Prairie Res.
Wickiup Reservoir
Pauline Lake
East Lake
Lapine
HARNEY
Hampton
Odell Lake
Crescent Lake
Gilchrist
KLAMATH
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WATER RESOURCES DEPARTMENT
DESCHUTES BASIN
MAP NO. 5.2

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Lower Main Stem Deschutes River, Lower Metolius, and Lower Crooked Rivers	))))))	Lower Deschutes Basin April 4, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of that portion of the Deschutes River including the main stem of the Deschutes River from its confluence with the Columbia River to river mile 120.0 as shown in USGS Water Supply Paper 344; the main stem of the Crooked River from its confluence with the Deschutes River to river mile 6.5 as shown on USGS Plans and Profiles, 1926; and the main stem of the Metolius River from its confluence with the Deschutes River to river mile 13.0 as shown in USGS Water Supply Paper 344;

WHEREAS in this study consideration was given to means and methods of augmenting such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control;

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Lower Deschutes Basin; and

WHEREAS as a result of said study the following findings have been reached by this board:

1. Recreation uses represent and will continue to bring substantial benefits to the state.

2. Fish and wildlife uses represent and will continue to bring substantial benefits to the state.

3. The mainstem of the Deschutes River from immediately below Pelton reregulating dam to its confluence with the Columbia River, excluding the City of Maupin as its boundaries are constituted on October 4, 1977, is designated as a State Scenic Waterway.

4. Hydroelectric power production utilizing the waters of the Deschutes River and its tributaries between river mile 100.0 and river mile 120.0 will bring substantial benefits to the state.

5. Domestic use does not represent a significant quantity either for existing or presently contemplated needs.

* Modifies Lower Deschutes Basin program dated April 3, 1964.

6. Mining use does not represent a significant quantity either for existing or presently contemplated needs.

7. Municipal use is not a significant factor for either existing or presently contemplated needs.

8. Pollution abatement is not a significant factor for either existing or presently contemplated needs.

9. Industrial use is not a significant factor for either existing or presently contemplated needs.

10. Irrigation use is not a significant factor for either existing or presently contemplated needs.

11. Drainage and reclamation of drained lands are not existing or presently contemplated factors in water use.

CONCLUSION

1. The maximum beneficial use of that portion of the main stem of the Deschutes River from its confluence with the Columbia River to and including river mile 100.0, is for recreation, fish and wildlife purposes and no appropriations of water in this area shall be permitted except for domestic, livestock, recreation, fish and wildlife uses.

2. The hydroelectric potential from river mile 100.0, main stem Deschutes River, to river mile 120.0, main stem Deschutes River, should be utilized. Such utilization is hereby encouraged for any properly state and federal licensed hydroelectric projects commensurate with multiple-purpose use for recreation, fish and wildlife, and constructed and operated in accordance with plans approved by the Water Policy Review Board. Projects constructed for hydroelectric power purposes must include regulation facilities as needed to minimize river flow fluctuations resulting from such project operation in order to protect downstream recreation, fish and wildlife values and must be so operated as to provide minimum pool fluctuations during the recreation season while maintaining minimum perennial flows downstream.

3. The waters of the Crooked River from its confluence with the Deschutes River to river mile 6.5 may be utilized for hydroelectric purposes commensurate with multiple-purpose use for recreation, fish and wildlife.

4. The waters of the Metolius River from its confluence with the Deschutes River to river mile 13.0 may be utilized for hydroelectric purposes commensurate with multiple-purpose use for recreation, fish and wildlife.

5. Projects to utilize the aforementioned waters must be approved by the Water Policy Review Board.

6. Water rights acquired for hydroelectric projects constructed for the purpose of utilizing the waters of the Deschutes, Metolius, and Crooked Rivers must be subordinate in priority to all existing and future upstream beneficial uses of water except for hydroelectric power.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) relating to the waters of the lower main stem Deschutes River, lower Metolius, and lower Crooked Rivers:

A. The maximum beneficial use of that portion of the main stem of the Deschutes River from its confluence with the Columbia River to and including river mile 100.0 is for recreation, fish and wildlife purposes and no appropriations of water in this area shall be permitted except for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, recreation, fish and wildlife uses.

B. The maximum economic development of the state and the attainment of the highest and best use of the waters of the lower main stem Deschutes River from river mile 100.0 to river mile 120.0 and the attainment of an integrated and balanced program for the benefit of the state as a whole will be achieved through utilization of the aforementioned waters for domestic, livestock, irrigation of lawn or noncommerical garden not to exceed one-half acre in area, hydroelectric power, fish, wildlife, and recreation purposes and the aforementioned waters of the main stem Deschutes River are hereby so classified.

C. The maximum economic development of this state and the attainment of the highest and best use of the waters of the lower main stem Crooked River from its confluence with the Deschutes River to river mile 6.5 and the waters of the main stem of the lower Metolius River from its confluence with the Deschutes River to river mile 13.0 will be attained through utilization of such waters for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, hydroelectric power, fish, wildlife, and recreation purposes and the aforementioned waters of the lower main stem, Crooked River, and lower main stem, Metolius River, are hereby so classified.

D. Applications for the use of such water shall not be accepted by any state agency for any other purpose and applications for such other purposes are declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

E. Water rights acquired for structures or works for the utilization of the waters for hydroelectric purposes shall be subordinate to all present and future upstream beneficial uses of water except for hydroelectric power. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

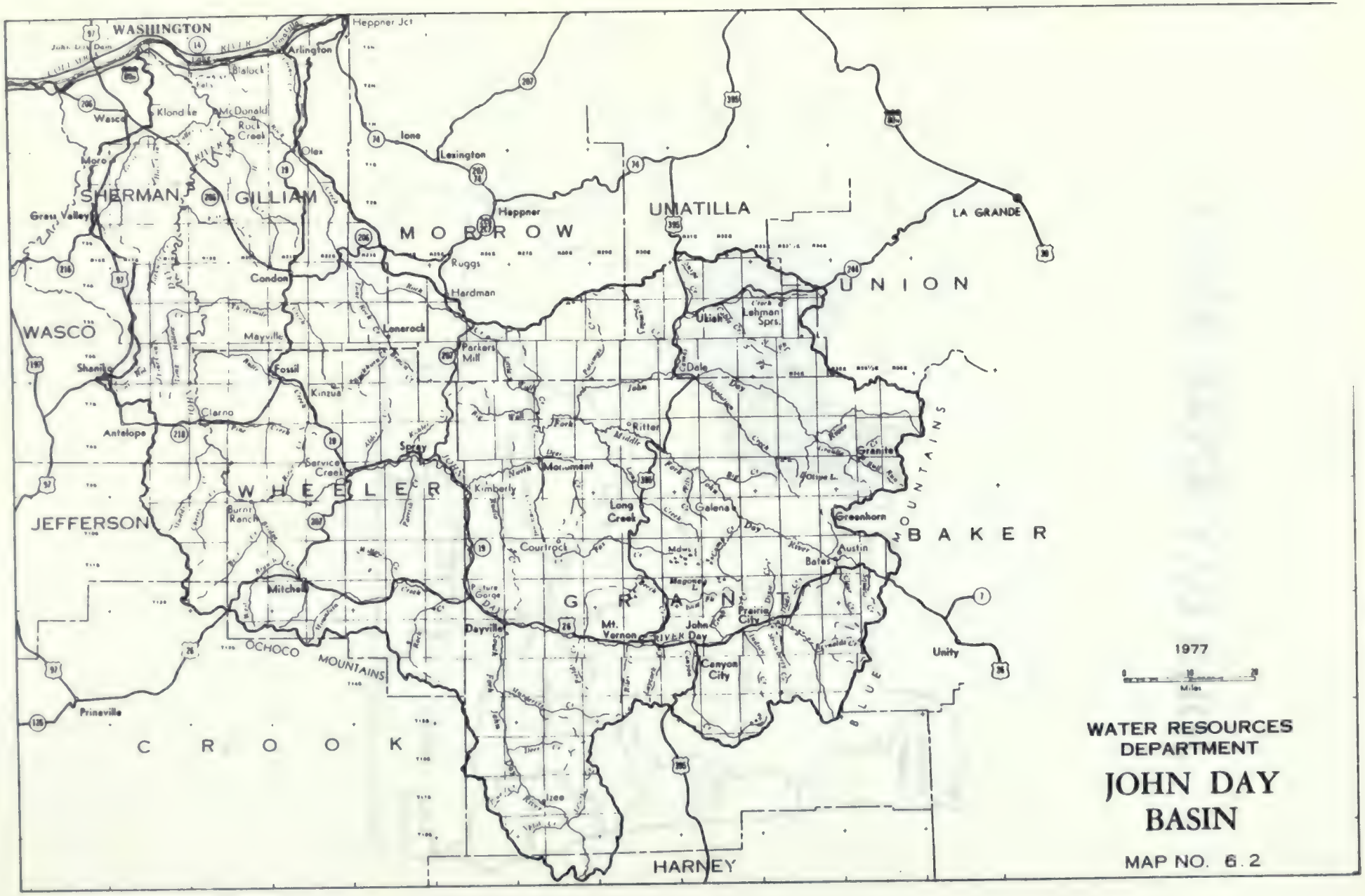
Done and dated this 4th day of April, 1981.

WATER POLICY REVIEW BOARD

By

Donel J. Lane, Chairman

JOHN DAY RIVER BASIN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Ruggs
Condon
Hardman
LA GRANDE
UNION
WASCO
Mayville
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Parkers Mill
Ukiah
Lehman Spgs.
Dale
Shanico
Fossil
Kinzua
Clarno
Antelope
Ritter
Granite
Spray
Service Creek
Monument
WHEELER
Kimberly
Long Creek
Galena
JEFFERSON
Burnt Ranch
Greenhorn
BAKER
Courtrock
Austin
Bates
Mitchell
Picture Gorge
GRANT
Dayville
Mt. Vernon
John Day
Prairie City
Unity
Canyon City
OCHOCO MOUNTAINS
Prineville
CROOK
Izee
HARNEY
BLUE MOUNTAINS
1977
Miles
WATER RESOURCES DEPARTMENT
JOHN DAY BASIN
MAP NO. 6.2

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the John Day River Basin	)))))	John Day River Basin April 4, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the John Day River Basin as delineated on State Water Resources Board Map, File 6.70146;

WHEREAS results of this study have been published in the State Water Resources Board Report, John Day River Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the John Day Basin;

WHEREAS as a result of said study the following findings and conclusions have been reached by this Board:

1. The total basin yield is adequate on an average year basis to supply all existing and presently contemplated needs and uses of water.

2. There are areas where the yield is not adequate to supply existing needs during a critical year.

3. Flows are not sufficient during low flow months to meeting existing or future demands, including the utilization of water to minimize pollution.

4. Simultaneous use of a major portion of the existing consumptive water rights results in flows at or near the zero level in many streams during the summer and early fall months.

5. Flows at or near the zero level also occur under natural conditons on many streams having little water under appropriation.

6. Augmentation of the water supply in periods of need can come through more efficient use of presently appropriated water.

* Modifies John Day River Basin program dated April 3, 1964

7. There are many physically feasible storage sites.

8. Available data indicate that the ground water resource is limited.

9. Ground water represents an important source of water, primarily in meeting existing domestic, livestock, and municipal needs.

10. There are substantial quantities of unappropriated water.

11. Over 1,400,000 acre-feet of the waters of the John Day River and its tributaries were withdrawn in 1915 by the State Engineer for out-of-basin diversion for irrigation, power and domestic purposes. This withdrawal amounts to more than the average annual discharge of the John Day River at McDonald Ferry.

12. No water has been applied to beneficial use under the aforementioned withdrawal.

13. Utilization of this withdrawal and its priority will preclude maximum beneficial use of the waters of John Day River within the basin.

14. More than 25 percent of the land holding water rights is no longer irrigated. More than 75 percent of the water appropriated for mining and power uses is no longer utilized for these purposes.

15. There is need to investigate modification or recission of the aforementioned withdrawals and unused rights.

16. There is need to insure water for domestic, livestock, municipal, and wildlife uses which, while small, are of great importance.

17. There is need to develop stock water facilities for better range utilization.

18. Irrigation is and will continue to be the major consumptive use of water.

19. There is substantial irrigation potential.

20. Irrigation development is restricted by the limited acreage of bottom land and the unfavorable location of other arable land.

21. Most irrigated lands do not receive an adequate supply of water throughout the irrigation season in an average water year and experience severe shortages in a critically low water year.

22. Storage would be necessary to provide an adequate water supply for irrigated and irrigable lands.

23. The hydroelectric power potential of the basin is limited.

24. Existing stream regiment and water use reduce the desirability of hydroelectric power development in the basin.

25. Present industrial use of water is small and is not expected to increase materially.

26. There is potential for increased mining activity.

27. Present mining use of water is small and is not expected to increase materially.

28. Water-based recreation is limited by low seasonal streamflows and the small number of lakes and reservoirs.

29. The main stem of the John Day River from Service Creek Bridge (river mile 157) to Tumwater Falls (river mile 10) is designated as a State Scenic Waterway.

30. The natural lakes have significant recreational value.

31. Fish life is and will continue to be the major nonconsumptive use of water.

32. A major conflict exists between irrigation and fish life use of water.

33. There is potential for enhancement of fish life and recreation.

34. Storage would be required to attain flows for enhancement of fish life and recreation.

35. Flows recommended by fisheries agencies are substantially higher at many locations than the flow levels that exist during an average water year.

36. Maintenance of minimum perennial streamflows would benefit fish life, wildlife and recreation.

37. Criteria for the determination of desirable base flows commensurate with all beneficial uses of water have not been developed.

38. Pollution of surface and ground water is local, intermittent in occurrence, and is not a serious basinwide problem.

39. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

40. Flooding and streambank erosion are serious local problems in some areas.

41. Erosion of cropland and rangeland is a major problem and often results in siltation of streams.

42. Major drainage problems occur on irrigated lands.

43. Because of physical and economic factors, classification of certain waters for limited-purpose use would be in the public interest.

44. The highest and best use of the waters of the John Day River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the John Day River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the John Day River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and the waters of the John Day River Basin are hereby so classified with the following exceptions:

1. The maximum economic development of this state, the attainment of the highest and best use of the waters of the natural lakes of the John Day River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development not to exceed 7 1/2 theoretical horsepower, recreation, wildlife and fish life uses, and the waters of the natural lakes of the John Day River Basin are hereby so classified.

2. The maximum economic development of this state, the attainment of the highest and best use of the waters of the John Day River from Service Creek Bridge (river mile 157) to Tumwater Falls (river mile 10), and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, industrial, mining, recreation, wildlife and fish life uses;

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic or livestock uses shall be made or granted by any state agency or public corporation of the state for the waters of:

1. The Middle Fork John Day River above its mouth or of its tributaries for flows of the Middle Fork John Day River at USGS Gage 14-0440 at Ritter (SW 1/4 NW 1/4 Section 8, Township 8 South, Range 30 East) below 10 cubic feet per second measured at said gage except that this limitation shall not apply to waters legally stored or legally released from storage.

2. The North Fork John Day River above former USGS Gage 14-0415 near Dale (SE 1/4 SE 1/4 Section 35, Township 6 South, Range 31 East) or of its tributaries above said gage for flows of the North Fork John Day River below 35 cubic feet per second measured at said gage except that this limitation shall not apply to waters legally stored or legally released from storage.

3. The North Fork John Day River above its mouth or of its tributaries for flows of the North Fork John Day River at USGS Gage 14-0460 at Monument (SE 1/4 Section 2, Township 9 South, Range 27 East) below 55 cubic feet per second measured at said gage except that this limitation shall not apply to waters legally stored or legally released from storage.

4. The John Day River above USGS 14-0465 at Service Creek (N 1/2 Section 18, Township 9 South, Range 23 East) or of its tributaries above said gage for flows of the John Day River below 30 cubic feet per second measured at said gage except that this limitation shall not apply to waters legally stored or legally released from storage.

5. The John Day River above its mouth or of its tributaries for flows of the John Day River at USGS Gage 14-0480 at McDonald Ferry (NW 1/4 Section 11, Township 1 North, Range 19 East) below 20 cubic feet per second measured at said gage except that this limitation shall not apply to waters legally stored or legally released from storage.

C. Applications for the use of the waters of the John Day River Basin shall not be accepted by any state agency for any other use and the granting of applications for such other uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give cognizance to the multiple-purpose concept.

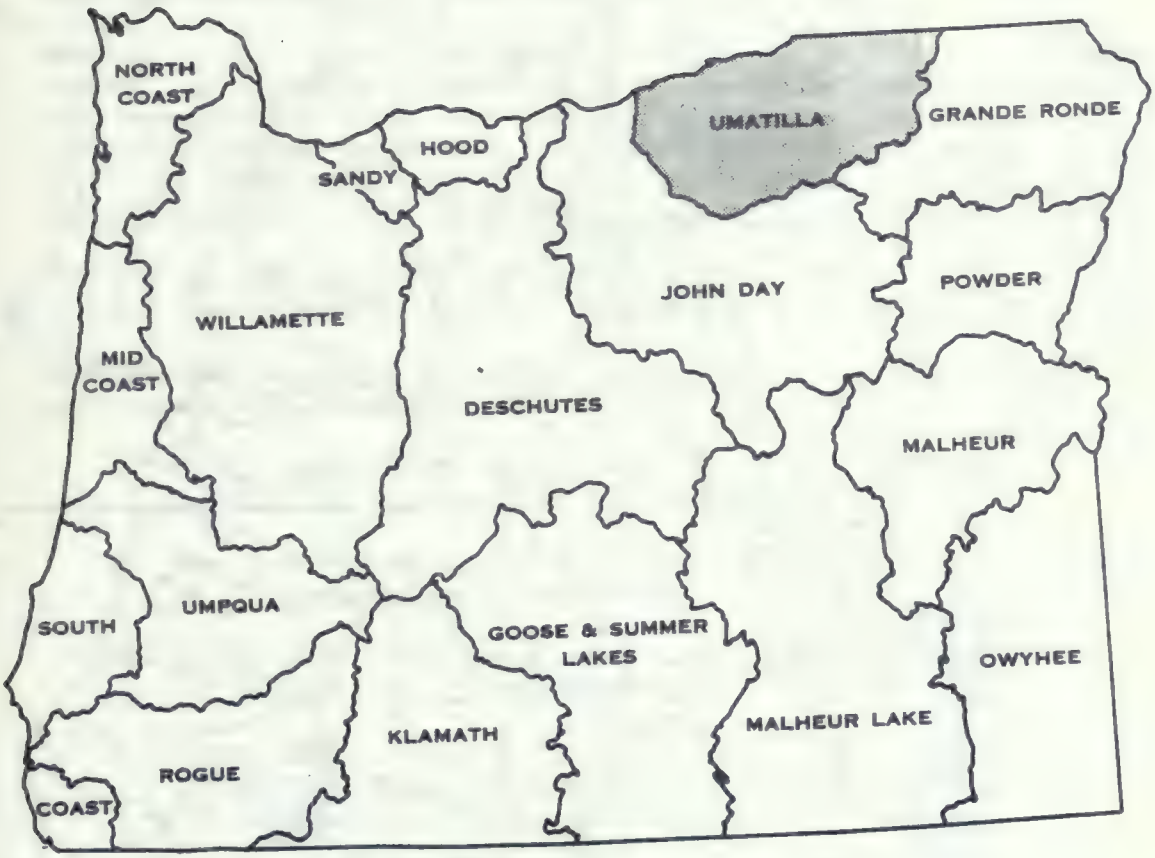
Done and dated this 4th day of April, 1981.

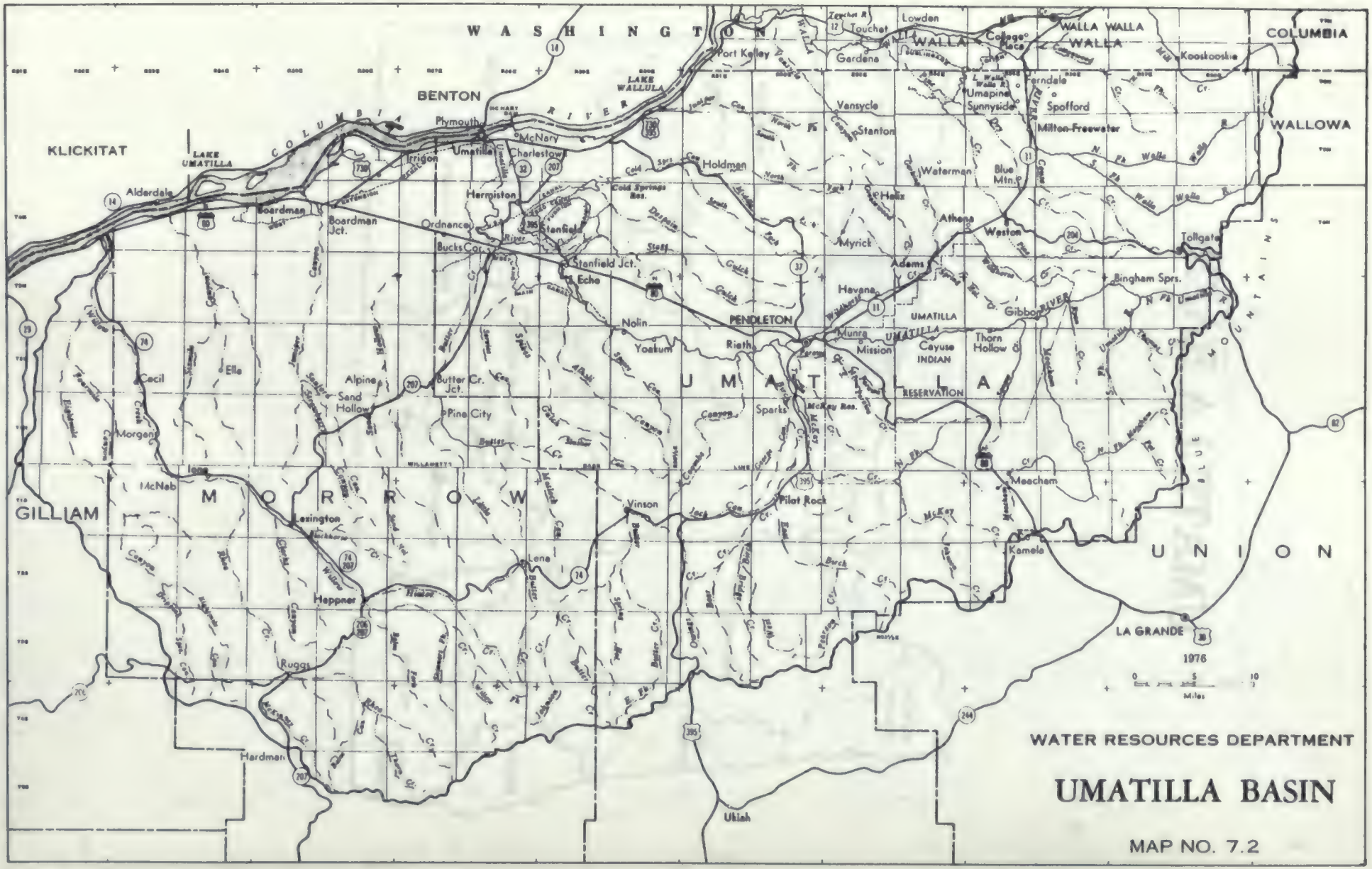
WATER POLICY REVIEW BOARD

By _____
Donel J. Lane, Chairman

4918A

UMATILLA BASIN

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LAKE UMATILLA
COLUMBIA RIVER
Plymouth
McNary
Umatilla
Irrigon
Charleston
Port Kelley
Touchet
Lowden
Gardena
College Place
WALLA WALLA
Kooskooskie
Umapine
Sunnyside
Spofford
Milton-Freewater
Vansycle
Stanton
Holdman
Waterman
Blue Mtn.
Hermiston
Cold Springs Res.
Ordnance
Stanfield
Bucks Cor.
Stanfield Jct.
Echo
Alderdale
Boardman
Boardman Jct.
Athena
Weston
Tollgate
Myrick
Adams
Bingham Sprs.
Havana
Gibbon
Nolin
Yoakum
Rieth
Munra
Mission
Cayuse INDIAN
Thorn Hollow
Cecil
Ella
Alpine
Sand Hollow
Butter Cr. Jct.
Pine City
Sparks
McKay Res.
Morgan
McNab
Lexington
Heppner
Lena
Vinson
Pilot Rock
Meacham
Kamela
Ruggs
Hardman
Ukiah
LA GRANDE
1976
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Miles
WATER RESOURCES DEPARTMENT
UMATILLA BASIN
MAP NO. 7.2

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the Matter of Formulating an Integrated, Coordinated Program for the Use and Control of the Water Resources of the Umatilla Basin	))))	Umatilla Basin April 4, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Umatilla Basin as delineated on State Water Resources Board Map, File No. 7.6;

WHEREAS results of this study have been published in the State Water Resources Board Report, Umatilla Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation and flood control; and

WHEREAS as the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Umatilla Basin; and

WHEREAS as a result of said study the following findings and conclusions were reached by this board:

1. Total quantities of surface water are inadequate to meet existing and contemplated future needs for water.

2. The groundwater resource is inadequate in most areas to meet existing and contemplated needs.

3. Coordinated development of surface and groundwater is required for progressive, stable growth.

4. There are sufficient land and water resources to double the irrigated acreage to 150,000 plus supplying additional needs for domestic, municipal, industrial and recreational use.

5. The Walla Walla River water supply will meet local requirements above the Oregon-Washington state line but will not allow for any appreciable transfer of surface water for use in Washington.

6. Augmentation of water supply during low flow periods can come through storage of surplus runoff, management of groundwater supplies and more efficient use of presently appropriated waters.

7. The waters of the North Fork of the Umatilla River including its springs and tributaries have been withdrawn by statute for municipal supply for the City of Pendleton. Statutory

*Modifies Umatilla Basin program dated February 13, 1964.

provision also provides for the diversion and storage of Ditch Creek water from the John Day to the Willow Creek Basin.

8. Maximum utilization of water requires further clarification of water rights both as to volume and to acres on the Umatilla Project.

9. Domestic, industrial, recreation, mining, livestock, and wildlife uses, while important, represent comparatively small quantities of water in existing and contemplated future needs.

10. Municipal use, mainly from groundwater, is a small but important consumptive use when determining water availability.

11. Irrigation uses over 90 percent of the consumptive use water and will continue to be the major consumptive user.

12. Suitable irrigable areas greatly exceed water supplies. There is a substantial potential for irrigation expansion. To achieve this expansion, certain water should be classified for irrigation purposes.

13. Worthwnile advantages could be obtained from extensive rehabilitation programs on most irrigated land and distribution facilities.

14. Use of water for hydroelectric power is decreasing and the physical and economic potential is limited.

15. Recreational use of inland waters including the Columbia River reservoir pools is of major importance to the basin and is associated primarily with sport fishing, boating, swimming, and water-fowl hunting.

16. Use of the basin's headwater streams by fish life is of importance to the basin. Development proposals on the Umatilla River and other major streams should consider anadromous fish runs.

17. Restrictions on further appropriations of natural streamflow would not materially aid in maintaining minimum flows because of over-appropriation during the low flow season.

18. Pollution of surface and groundwater is localized, intermittent in occurrence and is only critical in a few large urban and industrial areas.

19. Serious damages, caused by flooding and erosion, are annual occurrences along all major streams in cropped areas.

20. Drainage problems exist on the lower portion of the large irrigated tracts.

21. Physical and economic factors justify limited-purpose use of certain waters.

22. The highest and best use of the waters of the Umatilla Basin is for domestic and livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life purposes.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with ORS 536.300 (2) pertaining to the water resources of the Umatilla Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Umatilla Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and the waters of the Umatilla Basin are hereby so classified with the following exception that 160,000 acre-feet annually of unappropriated water be classified for domestic, livestock, irrigation, municipal and industrial purposes from the Walla Walla and Umatilla Rivers designated as follows: 30,000 acre-feet annually of the yield above USGS-State Engineer Gage 100, South Fork Walla Walla River for domestic, livestock, irrigation, municipal, and industrial purposes; 10,000 acre-feet annually of the yield above USGS-State Engineer Gage 110, North Fork Walla Walla River for domestic, livestock, irrigation, municipal and industrial purposes; and 120,000 acre-feet annually of the yield above former USGS Gage 205, Umatilla River for domestic, livestock, irrigation, municipal, and industrial purposes.

B. To support present and proposed basin resource developments, no out-of-basin or out-of-state appropriations of water shall be made or granted by any state agency or public corporation of the state for the waters of the Walla Walla River, Umatilla River or Willow Creek Subbasins.

C. Applications for the use of the water of the Umatilla Basin shall not be accepted by any state agency for any other use and the granting of applications for such other uses is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or

works are further declared to be prejudicial to the public interest which do not give cognizance to the multi-purpose concept.

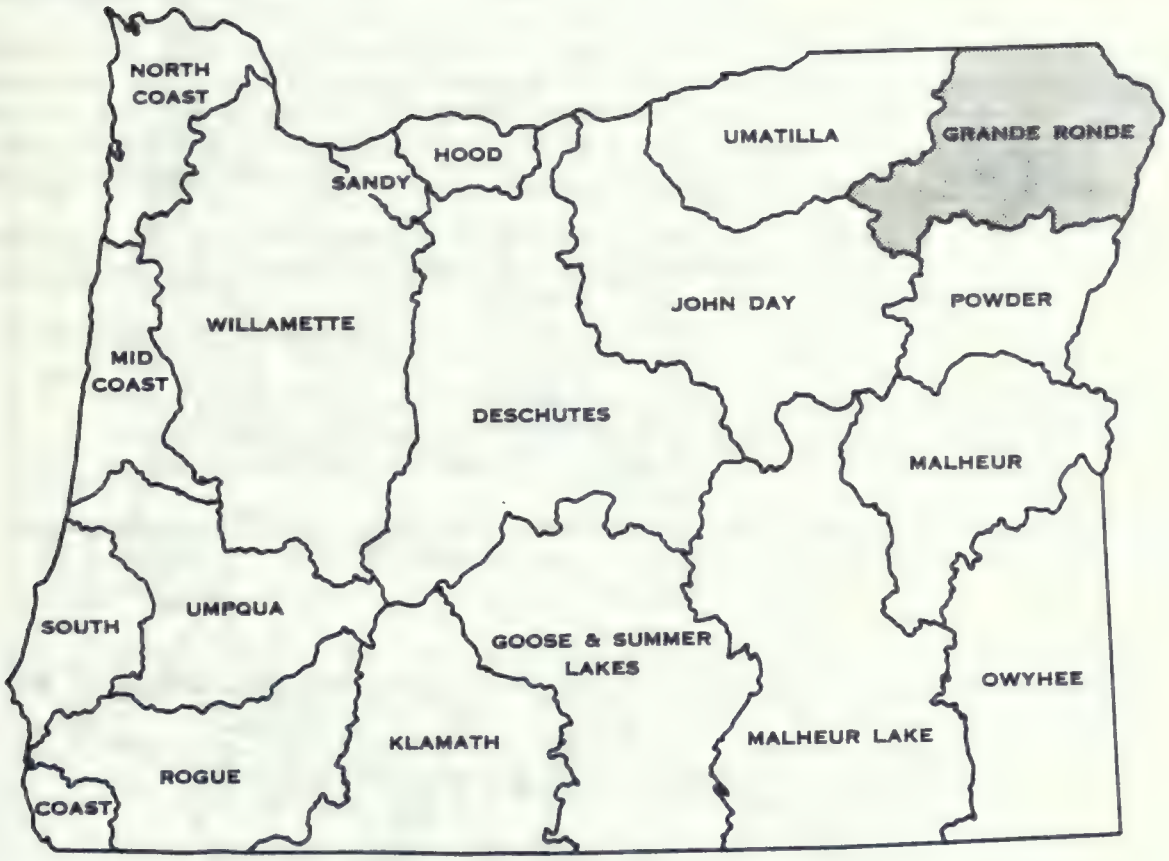
Done and dated this 4th day of April 1981.

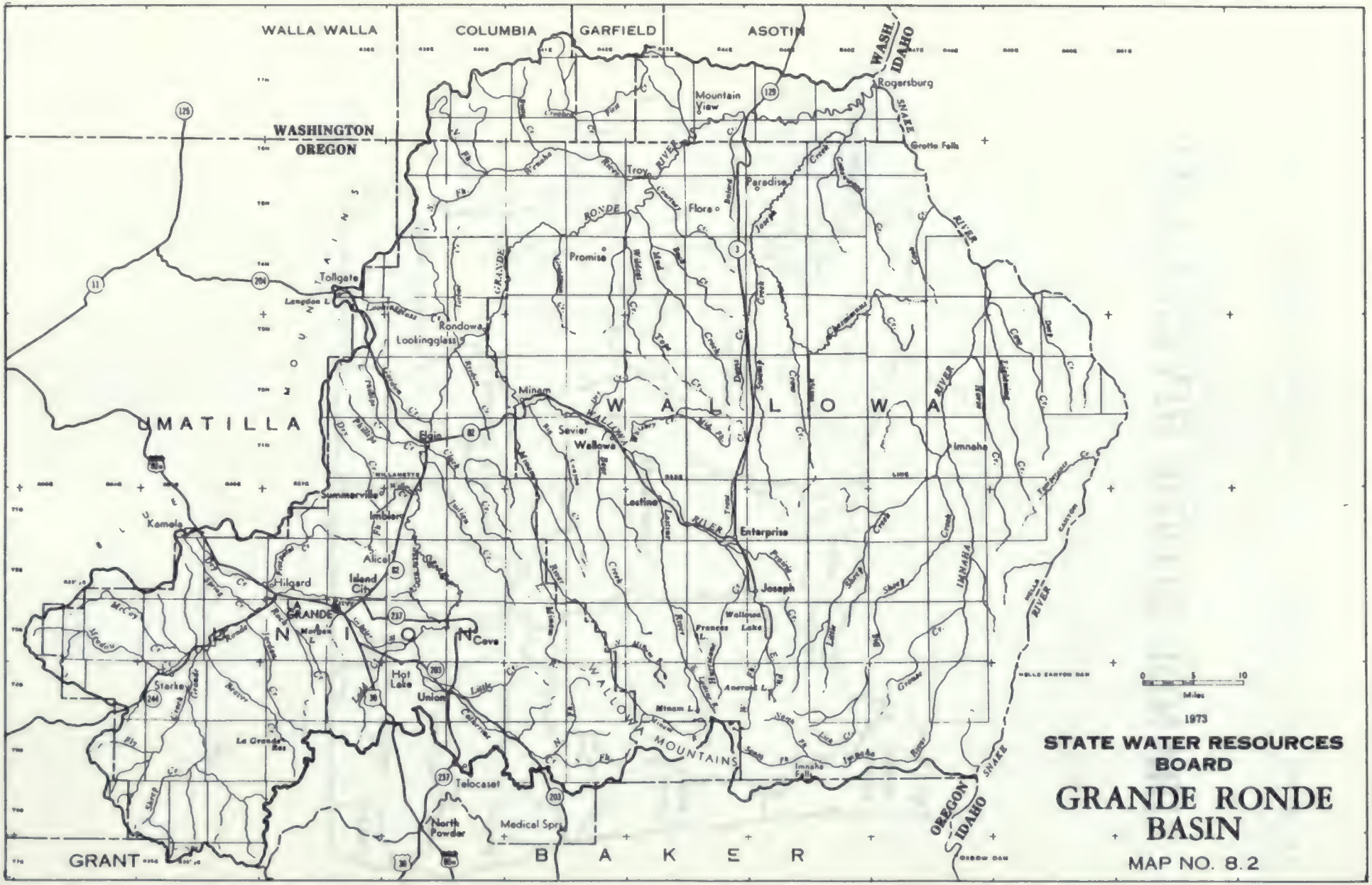
WATER POLICY REVIEW BOARD

By _____
Donel J. Lane, Chairman

4677A

GRANDE RONDE RIVER BASIN




WALLA WALLA
COLUMBIA
GARFIELD
ASOTIN
WASH.
IDAHO
WASHINGTON
OREGON
Rogersburg
Mountain View
Grotte Falls
Troy
Paradise
Flora
Promise
Tollgate
Langdon L.
Rondowa
Lookingglass
Minam
WALLOWA
Sevier
Wallowa
Imnaha
UMATILLA
Elgin
Summerville
Imbler
Lostine
Enterprise
Kamela
Alicel
Hilgard
Island City
Joseph
LA GRANDE
Wallowa Lake
Frances L.
Cove
Starkey
Hot Lake
Union
Minam L.
Aneroid L.
WALLOWA MOUNTAINS
Imnaha Falls
Telocaset
North Powder
Medical Spgs
OREGON
IDAHO
SNAKE
GRANT
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1973
STATE WATER RESOURCES BOARD
GRANDE RONDE BASIN
MAP NO. 8.2

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Grande Ronde River Basin	)))))	Grande Ronde River Basin April 4, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Grande Ronde Basin;

WHEREAS results of this study have been published in Water Resources Board Report, Grande Ronde Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Grande Ronde Basin;

WHEREAS as a result of said study the following findings have been reached by this board:

1. Total quantities of water are sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. There is enough water on a critical year basis, assuming a greatly increased degree of water development and control, to meet existing and contemplated consumptive needs.

3. Serious dislocations exist in terms of distribution of the resource with regard to physical location and with respect to availability during time of need.

4. The existence of ground water has been established in certain sections of the basin, but the quantitative amounts have not been determined.

5. Many streams in the system do not provide enough flow for present nonconsumptive public use needs in periods of relatively low as well as critical flow.

6. Depletion potentials on some streams, due to existing consumptive rights, are such that the simultaneous use of any major portion of existing rights could result in zero flows or flows approaching the zero level during critical low flow periods.

* Modifies Grande Ronde River Basin program dated April 3, 1964.

7. Flows, unless augmented by storage, would not be sufficient on most streams during the summer months of low flow years to supply future consumptive and nonconsumptive demands.

8. Certain major rivers, or river sections, and numerous minor streams and creeks are by nature of their physiography, location, land ownership, or economic potential, available only for limited resource uses.

9. There is need to insure quantities of water sufficient for domestic, livestock, and municipal uses which, while small, are of great benefit to the state.

10. The expansion of industrial uses will in part depend on the development of stable water supplies from surface runoff and/or ground water potentials.

11. Potentials for industrial use of water are important to the economy of the basin, but foreseeable needs are not large quantitatively in comparison with potential irrigation, recreation, and fish life possibilities.

12. There are substantial potentials for the development of the agricultural economy of the basin through expanded irrigation.

13. Unavailability of dependable supplies of adequate water in the future will restrict the agricultural potential of the basin.

14. The basin has substantial physical potential for the generation of hydroelectric energy, but economic factors limit possibilities for development in the foreseeable future.

15. The release of water from storage projects in the Grande Ronde Basin for use in power generation at Lower Snake and Lower Columbia River plants would have economic value.

16. Use of water in the basin for mining purposes is minor quantitatively and major expansion of this use is not anticipated.

17. Full development of the fisheries potentials of the basin cannot be realized without the improvement of minimum and low flow conditions in many streams.

18. Material improvement in minimum and low flows for fish life and pollution abatement cannot be achieved without the development of surface water storage.

19. Development of storage reservoirs at some locations would have adverse effects on existing spawning areas.

20. Water consumption by wildlife does not represent a significant quantity.

21. The basin has great potential for recreational use of water, but diversity within this category is limited.

22. Plans for water resource development should attempt to maximize appurtenant recreational features.

23. Pollution abatement problems stem principally from miscellaneous untreated wastes and low flow conditions.

24. Maintenance of minimum perennial streamflows for recreation and fish life would bring benefits to the state.

25. The attainment of desirable base flows through storage would, in general, benefit recreation, wildlife, fish life, pollution abatement, and other public uses.

26. Major foreseeable quantitative uses of water in the Grand Ronde Basin will be for irrigation, recreation, and fish life uses.

27. Establishment of restrictions on further appropriations would prevent an increase in depletion potential on some streams which would aid in maintaining minimums where streams are not now appropriated beyond their natural capacity at critical periods.

28. Where streams are seasonally overappropriated, the establishment of restrictive actions would have no major practical effect until additional flows became available from return flows of major upstream developments or from storage.

29. Large areas of the Grande Ronde and Wallowa Valleys have drainage problems.

30. Sections of the high Wallowas are subject to a water erosion problem.

31. The flood control problem is an item of major interest and of great economic importance to the public.

32. Major augmentation of the water resources in periods of need must come through storage of surplus runoff.

33. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

34. It is imperative that single-purpose development of available sites does not preclude full utilization of the resource.

35. Criteria for determination of desirable base flows commensurate with all beneficial uses of water have not been developed.

36. Physical features, degree of economic development, and water use requirements vary from subbasin to subbasin.

NOW THEREFORE BE IT RESOLVED that for the reason of the variance in physical features, degree of economic development, and water use requirements from subbassin to subbasin, the board adopts the following findings and issues program statements for each of the subbasins of the Grande Ronde Basin.

UPPER GRANDE RONDE

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Upper Grande Ronde Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, widlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of such studies the following findings have been reached by this board:

1. Total quantities of water are sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water in this basin with the exception of utilization of water to minimize pollution.

2. There is enough water on a critical year basis to meet existing and contemplated consumptive needs.

3. Serious dislocations exist in terms of distribution of the resource with regard to physical location and with respect to availability during time of need.

4. The existence of major ground water supplies in this basin has not been established and cannot be considered as a major source for meeting future water needs.

5. Some streams in the basin do not provide enough flow for nonconsumptive public uses at periods of relatively low as well as critical flow.

6. Flows, unless augmented by storage, would not be sufficient on many streams during the summer months of critically low flow years to supply future consumptive and nonconsumptive demands.

7. Certain river sections and numerous minor streams and creeks are by nature of their physiography, location, land ownership, or economic potential, available only for limited resource uses.

8. There is need to insure quantities of water for domestic, livestock, and municipal uses which, while small, are of benefit to the state.

9. Potentials for expanded industrial use of water within this basin do not appear large.

10. Water from this basin may be used for industrial purposes in other sections of the Grande Ronde Basin if stable supplies are developed.

11. Extensive expansion of irrigation is not expected in this basin, but water stored within the basin may be put to use for this purpose in other areas of the Grande Ronde Basin.

12. This basin has little foreseeable potential for at-site hydroelectric development of a major character although water may be stored to be released for downstream power production on the Lower Snake and Lower Columbia Rivers.

13. The basin has potential for expanded recreational use of water. Recreational use would be expanded if more water surface area for boating, water skiing, and similar uses were available. Plans for water resource development should attempt to maximize appurtenant recreational features.

14. Full development of the fisheries potentials of the basin cannot be achieved without the improvement of minimum and low flow conditions.

15. The minimum perennial streamflows that can be established on the basis of existing rights and priorities, are substantially lower on some streams than the flows considered as minimums acceptable to the fisheries interests.

16. Major improvement in minimum flows cannot be obtained without the development of surface water storage.

17. Surface water storage could interfere with anadromous fish migrations and spawning areas at some potential storage sites.

18. Water consumption by wildlife does not represent a significant quantity.

19. Pollution abatement problems within this basin are minor with the exception of periodic siltation from mining operations.

20. Drainage and reclamation of drained lands are not present or contemplated significant factors in water use.

21. There are physically feasible storage sites in the basin.

22. The expansion of mining uses is not expected to be great in the foreseeable future.

23. No major flood problem exists within this basin.

24. The basin contains storage sites which are essential to the control of downstream floods by water retention.

25. It is imperative that single-purpose development of available water control sites does not preclude full utilization of the resource.

26. Maintenance of minimum perennial streamflows would be in the public interest. Attainment of flows acceptable to the fisheries interests will be achieved only through storage.

27. Full utilization of the water resource potential of the Upper Grande Ronde Basin will be achieved only through storage.

28. Establishment of restrictions on further appropriations would prevent an increase in depletion potential on some streams and aid in maintaining minimums where streams are not now appropriated beyond their natural capacity at critical periods.

29. Utilization of flows to minimize pollution from untreated wastes should not be permitted if such use limits or conflicts with the multiple-purpose concept.

30. The maximum beneficial uses of the waters of the Upper Grande Ronde Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with ORS 536.300(2) pertaining to the water resources of the Upper Grande Ronde Basin:

A. The maximum economic development of this state and the attainment of the highest and best use of the waters of the Upper Grande Ronde for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses and the waters of the Upper Grande Ronde Basin are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic or livestock uses shall be made or granted by any state agency or public corporation of the state for the waters of the Upper Grande Ronde River at USGS Gage 3190 (located in Section 36, Township 2 South, Range 37 East) below 15 cubic feet per second except that this limitation shall not apply to water legally stored or legally released from storage.

C. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

E. Water rights acquired for hydroelectric power purposes utilizing the waters of the Upper Grande Ronde Basin shall be subordinate in priority to future upstream beneficial uses of water except for hydroelectric power.

F. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

MIDDLE GRANDE RONDE

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Middle Grande Ronde Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of such studies the following findings have been reached by this board:

1. Total quantities of water are sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of the utilization of water to minimize pollution.

2. There is enough water on a critical year basis to meet existing and contemplated consumptive needs.

3. Serious dislocations exist in terms of distribution of the resource with regard to physical location and with respect to availability during time of need.

4. The existence of ground water has been established in certain sections of the basin, but the quantitative amounts available for development have not been determined.

5. Many streams in the basin do not provide enough flow for nonconsumptive public use needs at present in periods of relatively low as well as critical flow.

6. Depletion potentials on some streams, due to existing consumptive rights, are such that the simultaneous use of any major portion of existing rights could result in zero flows or flows approaching the zero level during critical low flow periods.

7. Flows, unless augmented by storage, would not be sufficient on important streams in the basin during the summer months of low flow years to supply future consumptive and nonconsumptive demands.

8. There is need to insure quantities of water sufficient for domestic, livestock, and municipal purposes which, while small, are of great benefit to the state.

9. The expansion of industrial uses within the basin will, in part, depend on the development of stable water supplies from surface runoff and/or ground water potentials.

10. The basin offers the major potential for industrial use of water in the Grande Ronde Basin, but foreseeable needs are not large quantitatively compared to other potential uses, primarily irrigation.

11. This basin offers the major potential for the expansion of irrigation use of water.

12. The unavailability of dependable supplies of adequate water in the future would be a restriction on the development of the agricultural potential of the basin.

13. One assured method of providing dependable supplies of water for agricultural use is through the development of surface water storage in this basin and the Upper Grande Ronde Basin. Potential irrigation requirements may be satisfied in part by ground water potentials, but the quantitative extent of this resource has not been fully determined.

14. There are no existing water rights for mining operations in this basin and the potentials for such use of water appear to be minor.

15. This basin has little foreseeable potential for at-site hydroelectric devlopments of major character although water may be stored to be released for downstream power production on the Lower Snake and Lower Columbia Rivers.

16. The basin has potential for expanded recreational use of water. Recreational use would be expanded if more water surface area for boating, waterskiing, and similar uses were available. Plans for water resource development should attempt to maximize appurtenant recreational features.

17. Full development of the fisheries potentials of the basin cannot be achieved without the improvement of minimum and low flow conditions.

18. Existing rights and priorities preclude the maintenance of minimum perennial streamflows on many of the streams of the basin under natural flow conditions in critical periods.

19. Drainage of irrigated lands in the basin is upon occasion a problem and could be an expanded problem with more extensive irrigation development in the future.

20. Major improvement in minimum flows cannot be obtained without the development of surface water storage.

21. Surface water storage could interfere with anadromous fish migrations and spawning areas at some potential sites.

22. Water consumption by wildlife does not represent a significant quantity.

23. Problems of pollution abatement do exist within this basin although they are not gross at the present time. Future expansion in the field of municipal, irrigation, and industrial growth could result in pollution abatement problems in the future if the treatment of waste discharges is not adequate.

24. There are physically feasible storage sites within this basin.

25. This basin experiences major flood damage.

26. Several alternatives are available for the solution of the flood control problem.

27. Local residents of the basin have attempted to solve their own flood problems.

28. The flood control problem of the Grande Ronde Valley (Middle Grande Ronde Basin) would be extremely difficult to solve on an individual aproach basis.

29. The basin contains storage sites which are essential to the control of downstream floods by water retention.

30. It is imperative that single-purpose development of available water control sites does not preclude full utilization of the resource.

31. Maintenance of minimum perennial streamflows would be in the public interest. Attainment of flows acceptable to the fisheries interests will be achieved only through storage.

32. Full utilization of the water resource potential of the Middle Grande Ronde Basin will be achieved only through storage.

33. Utilization of flows to minimize pollution from untreated wastes should not be permitted if such use interferes with the multiple-purpose concept.

34. The maximum beneficial uses of the waters of the Middle Grande Ronde Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with the provisions of ORS 536.300 (2) pertaining to the water resources of the Middle Grande Ronde Basin:

A. The maximum economic development of this state and the attainment of the highest and best use of the waters of the Middle Grande Ronde Basin and the attainment of an integrated and coordinated program for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life purposes and the waters of the Middle Grande Ronde Basin are hereby so classified.

B. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

C. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on the condition that any effluents or return flows from such uses shall not interfere with other beneficial uses.

D. Water rights acquired for hydroelectric power purposes utilizing the waters of the Middle Grande Ronde Basin shall be subordinate in priority to future beneficial uses of water except for hydroelectric power.

E. Structures or works for utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

LOWER GRANDE RONDE

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Lower Grande Ronde Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of waters for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Lower Grande Ronde Basin;

WHEREAS as a result of such studies the following findings have been reached by this board.

1. Total quantities of water are sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. There is enough water on a critical year basis to meet existing and contemplated consumptive needs for water.

3. Serious dislocations exist in terms of distribution of the resource with regard to physical location and with respect to availability during time of need.

4. The existence of major ground water supplies in this basin has not been established and cannot be considered as a major source for meeting future water needs.

5. Many streams in the system do not provide enough flow for nonconsumptive public use needs at present in periods of relatively low as well as critical flow.

6. Depletion potentials in this basin are not generally sufficient to reduce streamflows to zero flow during periods of critical flow.

7. Flows, unless augmented by storage, would not be sufficient on most streams during the summer months of low flow years to supply future consumptive and nonconsumptive demands.

8. Certain major river sections and numerous minor streams and creeks are by nature of their physiography, location, land ownership, or economic potential, available only for limited resource uses.

9. There is need to insure quantities of water sufficient for domestic, livestock, and municipal uses which, while small are of great benefit to the state.

10. No major expansion of industrial uses of water is anticipated within this basin in the foreseeable future.

11. No material use of water for irrigation purposes is anticipated within this basin in the foreseeable future.

12. There are no rights in this basin for the use of water for mining purposes and the expansion of this use is not anticipated within the foreseeable future.

13. This basin has substantial potential for the development of hydroelectric energy, but economic factors limit the possibilities of development in the foreseeable future.

14. The full development of the fisheries potentials of this basin cannot be realized without the improvement of low flow conditions in many streams of the basin.

15. Material improvement in minimum and low flows cannot be achieved without the development of surface water storage.

16. The basin has great potential for recreational use of water, but diversity within this category is limited.

17. Water consumption by wildlife does not represent a significant quantity.

18. Pollution problems in this basin are minor due to the low population density and low level of development.

19. There are no major flood control problems within this basin.

20. Major foreseeable quantitative uses of water in the Lower Grande Ronde Basin will be for recreational and fish life uses.

21. The establishment of restrictions on further appropriations would prevent an increase in depletion potential on some streams which would aid in maintaining minimums where streams are not now appropriated beyond their natural capacity at critical periods.

22. There are no major problems connected with drainage or the reclamation of drained lands within this basin.

23. Water resources would be sufficient on the main stem of the Grande Ronde and its major tributary, the Wenaha, during summer months of critically low flow periods to supply future consumptive needs. However, resources would not be adequate without storage to supply nonconsumptive demands for minimum flows.

24. The minimum perennial streamflows that can be established on the basis of existing rights and priorities under natural flow conditions, are substantially lower than the flows considered as minimums acceptable to the fisheries interests.

25. The establishment and maintenance of minimum perennial streamflows would be in the public interest. Attainment of flows acceptable to the fisheries interests will be achieved only through storage.

26. Full utilization of the water resource potentials of the Lower Grande Ronde Basin will be achieved only through storage. This basin contains storage sites for surplus runoff, but their economic feasibility is not fully established.

27. Utilization of flows to minimize pollution from untreated wastes should not be permitted if such use interferes with the multiple-purpose concept.

28. It is imperative that single-purpose development of available water control sites does not preclude full utilization of the resource.

29. The maximum beneficial use of the waters of the Lower Grande Ronde Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) relating to the waters of the Lower Grande Ronde Basin:

A. The maximum economic development of this state and the attainment of the highest and best use of waters of the Lower Grande Ronde Basin and the attainment of an integrated and coordinated program for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses and the waters of the Lower Grande Ronde Basin are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic or livestock uses shall be made or granted by any state agency or public corporation of the state for the waters of the Grande Ronde River, or its tributaries above USGS Gage 3325 (located below Rondowa in Section 23, Township 3 North, Range 40 East), for flows of the Grande Ronde River at USGS Gage 3325 below 300 cubic feet per second except that this limitation shall not apply to water legally stored or legally released from storage.

C. Further, no appropriations of water except for domestic or livestock uses shall be made or granted by any state agency or public corporation of the state for the waters of the Grande Ronde River or its tributaries for flows of the Grande Ronde River at its intersection with the Oregon-Washington border below 420 cubic feet per second except that this limitation shall not apply to water legally stored or legally released from storage.

D. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

E. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

F. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

WALLOWA RIVER

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Walowa River Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Wallowa River Basin;

WHEREAS as a result of such studies the following findings have been reached by this board:

1. Total quantities of water are sufficient on an average year basis to satisfy all existing and contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. There is enough water on a critical year basis to meet existing and contemplated consumptive needs.

3. Serious dislocations exist in terms of distribution of the resource with regard to physical location and with respect to availability during time of need.

4. Ground water potential exists in certain areas of the Wallowa Basin, but is not quantitatively identified.

5. The potential for storage development in the Wallowa Basin is extremely limited. Many streams in this system do not provide enough flow for nonconsumptive public use needs in periods of relatively low as well as critical flow.

6. Depletion potentials on some streams, due to existing consumptive rights are such that the simultaneous use of any major portion of existing rights could result in zero flows or flows approaching the zero level during critical low flow periods.

7. Flows, unless augmented by storage, would not be sufficient on important streams in the basin during the summer months of low flow years to supply consumptive and nonconsumptive demands.

8. Certain rivers, major river sections, and numerous minor streams and creeks are by nature of their physiography, location, land ownership, or economic potential, available only for limited resource uses.

9. There is need to insure quantities of water sufficient for domestic, livestock, and municipal uses which, while small, are of great benefit to the state.

10. Potentials for industrial use of water are important to the economy of the basin, but foreseeable needs are not large quantitatively.

11. The basin has physical potential for the development of hydroelectric energy, but economic factors limit the possibilities of development in the foreseeable future, both for at-site and downstream energy production.

12. Full development of the fisheries potentials of the basin cannot be realized without the improvement of minimum and low flow conditions in many streams of the basin.

13. Water consumption by wildlife does not represent a significant quantity.

14. Material improvement in minimum and low flows cannot be achieved without the development of surface water storage, but the potentials for such storage are greatly limited.

15. The basin has potential for expanded recreational use of water, but diversity within this category is limited. Plans for water resource development should attempt to maximize appurtenant recreational features.

16. The entire Minam River from Minam Lake downstream to its confluence with the Wallowa River is designated by statute as a State Scenic Waterway.

17. Nearly all of the lands susceptible to irrigation development in the Wallowa River Basin are presently under irrigation.

18. No water rights for mining use exist within this basin and foreseeable requirements for this use are negligible.

19. Pollution abatement problems do exist in this basin, but they are not presently major problems.

20. A flood control problem does exist within this basin. It appears that the solution to the flood problem in this area is the development of local flood protective facilities.

21. The headwater areas of the Wallowa system are subject to severe erosion. The major area lies largely within the Eagle Cap Wilderness Area.

22. Major foreseeable quantitative uses of water in the Wallowa River Basin will be for recreation and fish life uses.

23. Establishment of restrictions on further appropriations would prevent an increase in depletion potential on some streams and aid in maintaining minimums where streams are not now appropriated beyond their natural capacity at critical periods.

24. It is imperative that single-purpose development of available storage sites does not preclude full utilization of the resource.

25. Utilization of flows to minimize pollution of untreated wastes should not be permitted if such use interferes with the multiple-purpose concept.

26. Major augmentation of the water resource in periods of need must come through storage of surplus runoff.

27. The potentials for storage of surplus runoff are greatly restricted.

28. There are physically feasible storage sites in the basin, but their economic feasibility is highly doubtful for the foreseeable future.

29. The minimum perennial streamflows that can be established on the basis of existing rights and priorities, are substantially lower than the flows considered as minimums acceptable to the fisheries interests.

30. The maximum beneficial use of the waters of the Wallowa River Basin will be for domestic, livestock, municipal, irrigation, industrial, power development, mining, recreation, wildlife, and fish life uses.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) relating to he water resources of the Wallowa River Basin:

A. The maximum economic development of this state and the attainment of the highest and best use of the waters of the Wallowa River Basin and the attainment of an integrated and coordinated program for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life purposes and the waters of the Wallowa River Basin are hereby so classified with the following specific exceptions:

   1. The maximum economic development of this state and the attainment of the highest and best use of the waters of the Minam River Basin and the attainment of an integrated and coordinated program for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation, recreation, wildlife, and fish life uses and the waters of the Minam River Basin are hereby so classified.

   2. Further, no out-of-basin diversions of waters of the Minam River shall be permitted for any use.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic or livestock uses shall be made or granted by any state agency or public corporation of the state for the waters of the Minam River, or its tributaries, above its mouth for flows of the Minam River at its mouth below 100 cubic feet per second except that this limitation shall not apply to water legally stored or legally released from storage.

C. Applications for use of the waters of the Wallowa River Basin shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency for waters of the Wallowa River Basin shall be issued only on the condition that any effluents or return flows from such uses shall not interfere with other beneficial uses.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

IMNAHA RIVER

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Imnaha River Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of such studies the following findings have been reached by this board;

1. Total quantities of water are sufficient on an average annual yield basis to satisfy all existing and contemplated needs and uses of water with the exception of water to minimize pollution.

2. There is enough water on a critical year basis to meet existing and contemplated consumptive needs and minimum nonconsumptive public uses.

3. Serious dislocations exist in terms of distribution of the resource with regard to physical location and with respect to availability during time of need.

4. The existence of significant supplies of ground water in this basin has not been established.

5. Many streams in the system do not provide enough flow for nonconsumptive public use needs in periods of relatively low as well as critical flow.

6. Depletion potentials on some tributary streams, due to existing consumptive rights, are such that the simultaneous use of any major portion of existing rights could result in zero flows or flows approaching the zero level during critical flow periods.

7. Flows, unless augmented by storage, would not be sufficient on many streams during the summer months of low flow years to supply future consumptive and nonconsumptive needs.

8. Physically feasible potentials for storage are very limited in this basin.

9. Certain river sections and numerous streams, creeks, and lakes are by nature of their physiography, location, land ownership, or economic potential, available only for limited resource uses.

10. There is need to insure quantities of water sufficient for domestic and livestock uses which, while small, are of great benefit to the state.

11. The potential for the expansion of municipal use is negligible.

12. The potential for the expansion of irrigation use of water is small.

13. The potential for expansion of industrial use of water is negligible.

14. The potential for expansion of mining use of water is considered to be small.

15. The basin has physical potential for water power development, but economic feasibility in the foreseeable future is improbable.

16. Recreation use of water would be enhanced by the improvement of minimum streamflows.

17. Improved minimum streamflows can be achieved only by storage of water during surplus runoff periods.

18. Pollution abatement problems, existing and contemplated, are of a minor nature.

19. Flood control is not a major problem in the basin.

20. The drainage of lands is not a major problem.

21. Development of storage at some locations would have adverse effects on anadromous fish and passage and/or on spawning areas.

22. The improvement of low flows for recreation would bring benefits to the state.

23. Utilization of flows to minimize pollution from untreated wastes should not be permitted if such use interferes with the multiple-purpose concept.

24. The upper limits of the Imnaha main stem is subject to a water erosion problem (Eagle Cap Wilderness Area).

25. It is imperative that single-purpose development of available sites does not preclude full utilization of the resource.

26. Major augmentation of the water resource in periods of need must come through storage of surplus runoff.

27. Establishment of restrictions on further appropriation would prevent an increase in depletion potentials on some streams which would aid in maintaining minimums where such streams are not now appropriated beyond their natural capacity in critical periods.

28. The maximum beneficial use of the waters of the Imnaha River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) relating to the water resources of the Imnaha River Basin:

A. The maximum economic development of the state and the attainment of the highest and best use of the waters of the Imnaha River Basin and the attainment of an integrated and coordinated program for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, widlife, and fish life purposes and the waters of the Imnaha River Basin are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic or livestock uses shall be made or granted by any state agency or public corporation of the state for the waters of the Imnaha River or its tributaries above USGS Gage 2920 (located in Section 16, Township 1 North, Range 48 East) for flows at that gage below 85 cubic feet per second except that this limitation shall not apply to water legally stored or legally released from storage.

C. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

D. Rights to the use of water for industrial or mining purposes granted by any state agency shall be issued only on the condition that any effluents or return flows from such uses shall not interfere with other beneficial uses.

E. Water rights acquired for hydroelectric power purposes utilizing the waters of the Imnaha River Basin shall be subordinate in priority to future upstream beneficial uses of water except for hydroelectric power.

F. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

Done and dated this 4th day of April, 1981.

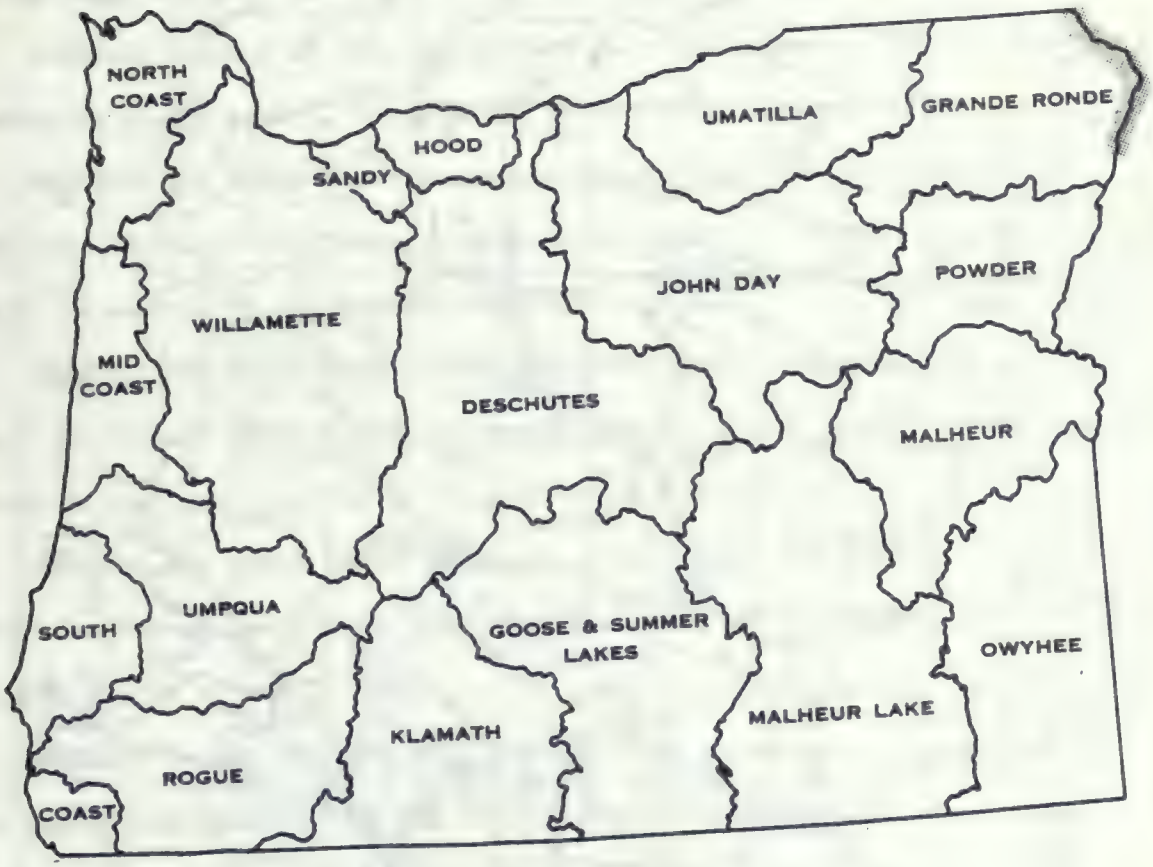
WATER POLICY REVIEW BOARD

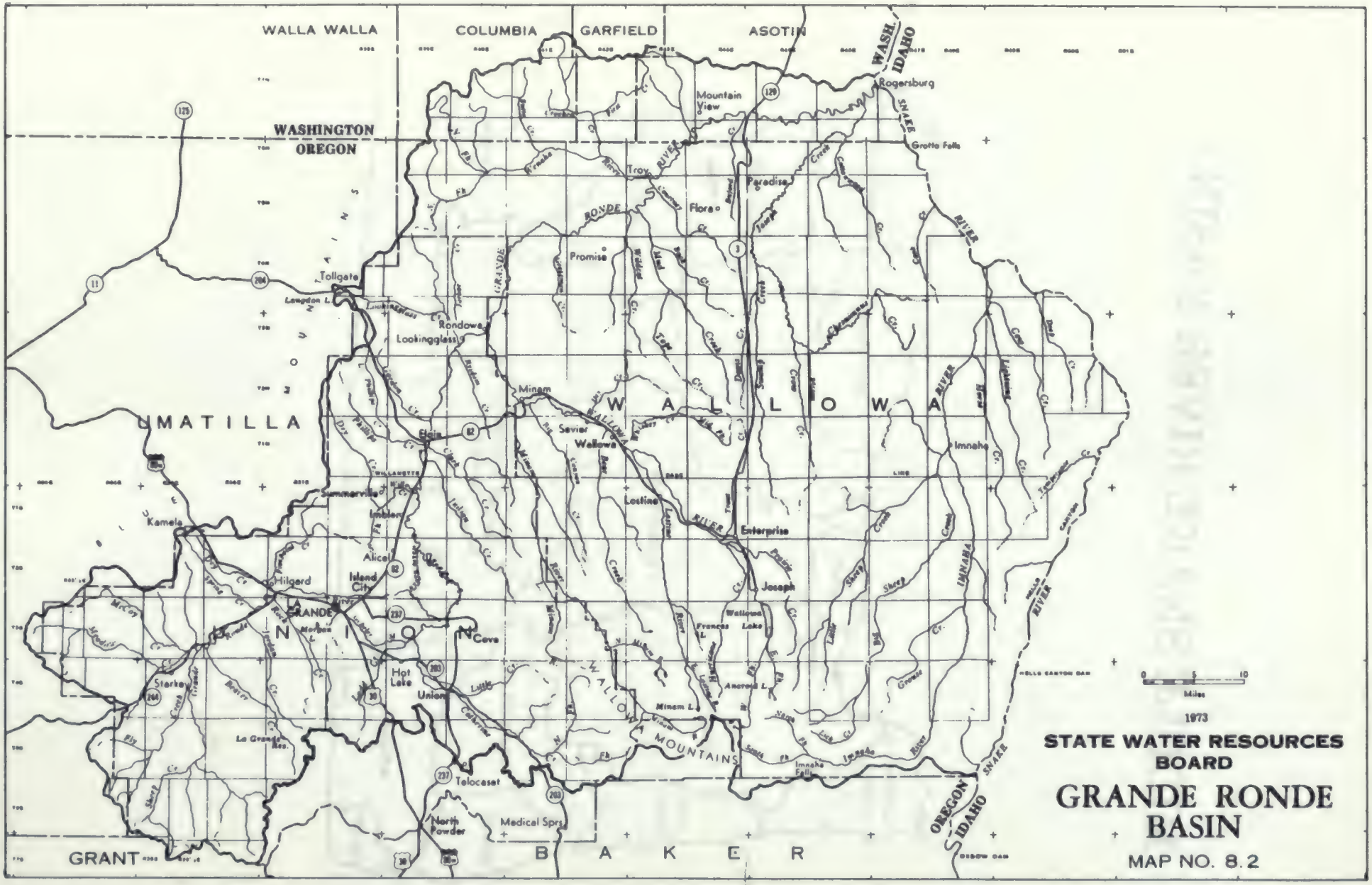
By _____

Donel J. Lane, Chairman

4711A

MIDDLE SNAKE RIVER BASIN




WALLA WALLA
COLUMBIA
GARFIELD
ASOTIN
WASH.
IDAHO
WASHINGTON
OREGON
Mountain View
Rogersburg
Grotte Falls
Troy
Paradise
Flora
Promise
Tollgate
Rondowa
Lookingglass
Minam
Wallowa
Elgin
Imnaha
UMATILLA
Summerville
Imbler
Lostine
Enterprise
Kamela
Alicel
Hilgard
Island City
Joseph
Cove
Hot Lake
Union
Starkey
La Grande
Elopement
Minam L.
Anderson L.
Frances L.
Wallowa Lake
Teloceset
North Powder
Medical Spgs.
GRANT
BAKER
OREGON
IDAHO
1973
STATE WATER RESOURCES BOARD
GRANDE RONDE BASIN
MAP NO. 8.2

BEFORE THE STATE WATER RESOURCES BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Middle Snake River Basin	Middle Snake River Basin October 28, 1974*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has completed a study of the Middle Snake River Basin from river mile 176.0 to river mile 247.0;

WHEREAS results of that study have been published in the State Water Resources Board report, Snake River Study dated August, 1958;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 first adopted a program dated March 5, 1960 to classify the water resources of the Middle Snake River Basin;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 and ORS 536.340 has undertaken a restudy of the Middle Snake River Basin from river mile 176.0 to river mile 247.0;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 may reclassify the water resources of the Middle Snake River Basin;

WHEREAS in all studies consideration was given to means and methods of augmenting, conserving and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, flood plains, and reservoir sites; and

*Modifies Middle Snake River Basin Programs dated March 5, 1960 and April 3, 1964.

WHEREAS as a result of said studies the following findings have been reached by this Board:

F I N D I N G S

1. The Middle Snake River and the adjacent lands between river mile 176 and river mile 247 are scenic, rugged, remote and unique in that they represent a portion of the deepest canyon on the North American Continent.
2. The Middle Snake River is of national significance because of its scenic and recreational attributes.
3. There is substantial interest in recreation on the Middle Snake River in its present state within Oregon.
4. Improved access would increase recreational use of the area.
5. Between river mile 176 and 247 there is substantial undeveloped hydroelectric potential.
6. The river and adjacent lands provide wildlife habitat for many species.
7. Domestic, mining, municipal, industrial, and irrigation water uses are not significant factors within the area.
8. The anadromous fish runs of the Columbia River System are an important economic and recreational asset to the state and the nation.
9. The Snake River and its tributaries are important to the anadromous fish runs of the Columbia.
10. There are a substantial number of impoundments above and below the Middle Snake Reach.
11. River flows within the Middle Snake below river mile 247 are

essentially controlled by upstream impoundments.

12. There is a need to maintain minimum flows and limit flow fluctuations for navigation, recreation, and aquatic life.
13. Anadromous fish runs terminate at the Hells Canyon projects.
14. At least one race of the anadromous fish in the main stem has already been significantly and adversely affected by existing impoundments.
15. Any major hydroelectric development will help meet the demands of increasing load growth.
16. Any major hydroelectric development on the Middle Snake will be of primary value for peaking purposes.
17. Any major hydroelectric development on the Middle Snake will alter the types of available recreational opportunities.
18. Any major hydroelectric development on the Middle Snake will have an adverse impact on the area's scenic attributes.
19. Any major hydroelectric development on the Middle Snake will adversely affect wildlife.
20. Any major hydroelectric development on the Middle Snake will essentially eliminate the existing resident fishery, although a replacement fishery would undoubtedly develop with an impoundment.
21. Any major hydroelectric development on the Middle Snake, if expediently licensed, could probably be constructed and operated sooner than an alternative of equivalent capacity.
22. In terms of projected electrical load growth, the hydroelectric potential of the Middle Snake River represents less than a year's

projected increase for the region.[1/]

23. Future upstream irrigation depletions could reduce the total energy production of any Middle Snake project.

24. In terms of projected electrical load growth, demands in the region[1/] could exceed resources in future years.

25. Given existing technology, an equivalent alternative to development on the Middle Snake, except in the case of additional installed capacity at existing hydroelectric structures, will require consumption of depletable resources.

26. In 1960, the State of Oregon, through the Hydroelectric Commission and with the concurrence of the State Water Resources Board, issued a license for a proposed development at the High Mountain Sheep site.

27. The natural state of the Middle Snake River represents its highest and best use to the State of Oregon.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with ORS 536.300(2) pertaining to the water resources of the Middle Snake River from river mile 176.0 to river mile 247.0:

A. The highest public benefit to the state and the attainment of the highest and best use of the waters of the Snake River from river mile 176.0 to river mile 247.0 and the attainment of an integrated and balanced program for the benefit of the state as a whole will be achieved through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre

1/ West group region defined as the states of Washington, Oregon, Northern California, and Northern Idaho.

in area, fish and wildlife, and recreation purposes and the aforementioned waters of the Snake River are hereby so classified.

B. Applications for the use of such water shall not be accepted by any state agency for any other purpose and applications for such other purposes are declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

C. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

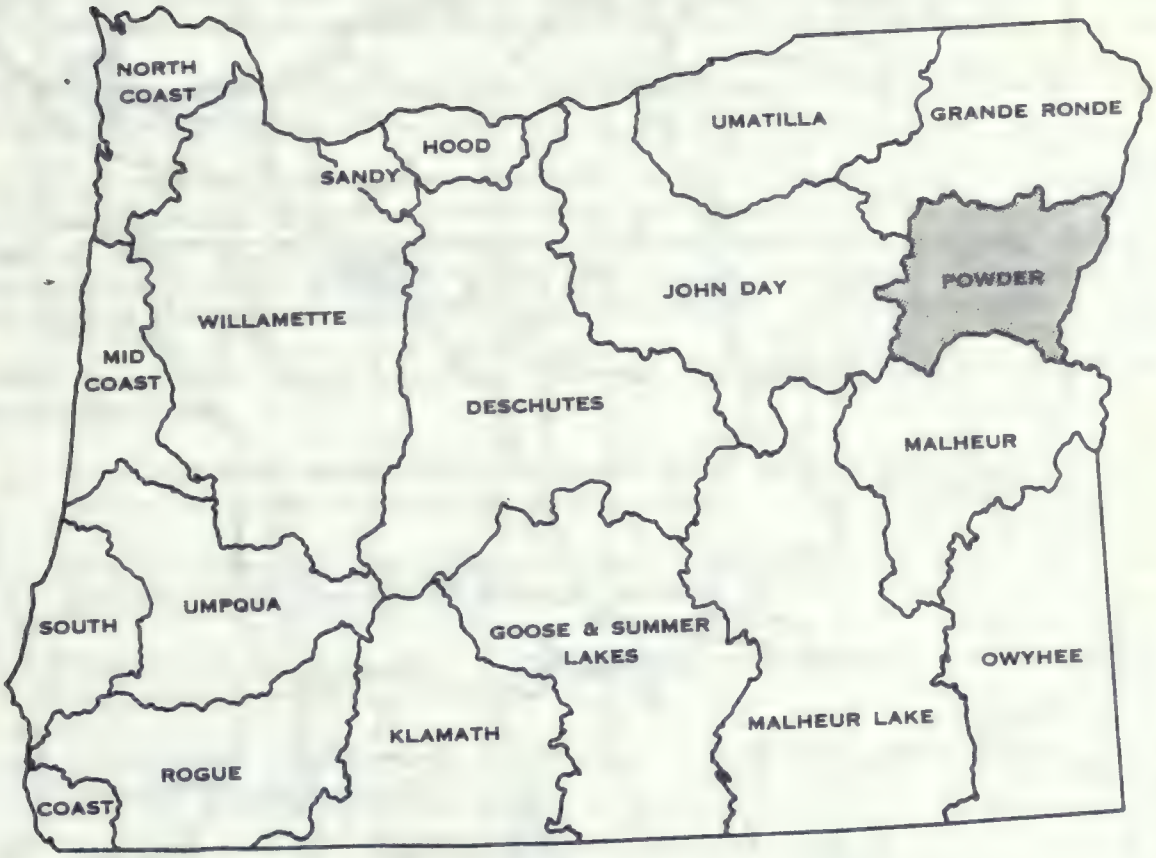
Done and dated this 28th day of October 1974.

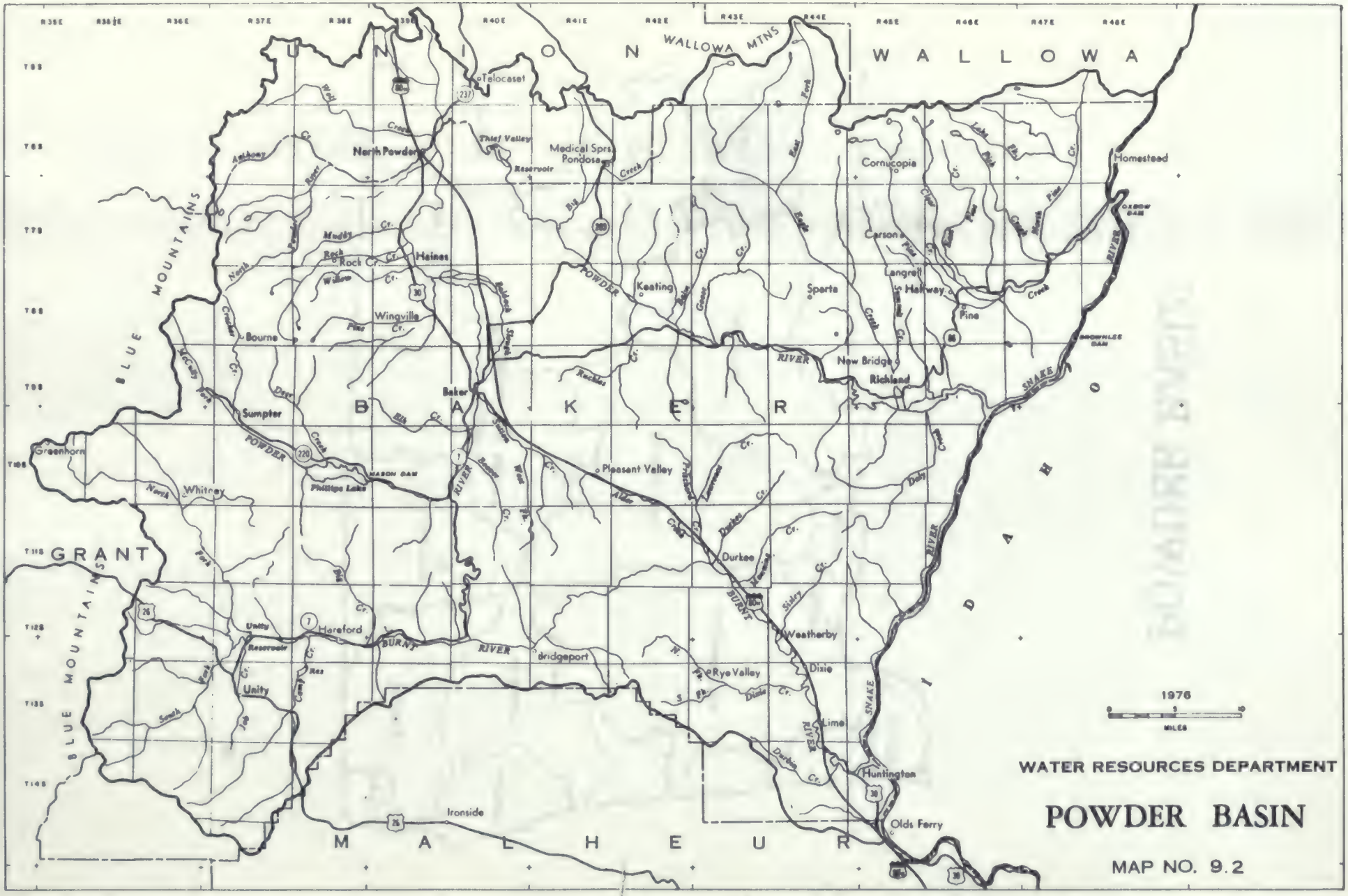
STATE WATER RESOURCES BOARD

By Albert E. Wright
Albert E. Wright, Interim Director

SWRB
10/28/74

POWDER BASIN





WATER RESOURCES DEPARTMENT

POWDER BASIN

MAP NO. 9.2

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Powder Basin	)))))	Powder Basin April 4, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Powder Basin as delineated on State Water Resources Board Map 9.6;

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Powder Basin.

WHEREAS this program does not modify, set aside or alter any existing rights to use water or the priority of such use established under existing law;

WHEREAS results of this study have been published in the State Water Resources Board Report, Powder River Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources; and to existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, flood plains, and reservoir sites; and

WHEREAS as a result of said study the following findings and conclusions have been reached by this Board:

1. The total basin water yield is adequate on an average annual basis to supply most of the presently developed needs and uses.

2. Serious water shortages exist each year in most areas because of the unequal seasonal and geographical distribution patterns.

3. The ground water resource is inadequate in most areas to meet existing and contemplated needs.

4. Coordinated development of surface and ground water is required for progressive, stable growth.

5. There are sufficient land and water resources, utilizing ground water and Snake River water in addition to basin streams, to increase the irrigated acreage about one-third from 135,000 to about 185,000 acres, furnish supplemental supplies for presently irrigated land, and supply additional needs for domestic, municipal, industrial, fish life, and recreation use.

6. Augmentation of water supply during low flow periods can come through storage of surplus runoff, utilization of ground water supplies, use of Snake River water and more efficient use of presently appropriated waters.

* Modifies Powder Basin Program dated June 26, 1970.

7. There are no statutory or State Engineer withdrawals on the use of water within the Powder Basin.

8. Maximum utilization of water requires cancellation of unused water rights. There are presently some unused power, mining, and irrigation water rights.

9. Domestic, livestock, municipal, industrial, recreation, and wildlife uses, while important, represent comparatively small quantities of water in existing and contemplated future needs.

10. Irrigation uses over 98 percent of the consumptive use water and will continue to be the major consumptive user.

11. Water requirements for potentially irrigable lands greatly exceed in-basin water supplies. There is, however, a substantial potential for irrigation expansion in some areas.

12. More efficient use and conservation of water could be obtained from extensive rehabilitation programs on most irrigated land and distribution facilities.

13. In-basin use of water for hydroelectric power is decreasing and the physical and economic potential is limited.

14. Recreation use of surface waters including the Snake River reservoirs, is of major importance to the basin and is associated primarily with sport fishing, boating, swimming, camping and hunting.

15. Use of the basin's headwater streams and lakes by resident fish life is of importance to the basin. Development proposals should consider fish life enhancement.

16. Most basin streams are overappropriated to the extent that during the low-flow season only streamflow required to satisfy downstream water rights is available to support fish life. Fish life would be benefited in a few streams, not presently overappropriated, by restrictions on further appropriation of natural streamflow.

17. Pollution of surface and ground water is localized, intermittent in occurrence and is most critical in a few urban and industrial areas.

18. Flood damages, concentrated in and near Baker, occur periodically as a result of ice jams on Powder River. Additional damages caused by flooding and erosion frequently occur along all major streams in cropped and pasture areas.

19. Drainage problems exist on the lower portion of large irrigated tracts.

20. Physical and economic factors justify limited-purpose use of certain waters.

21. The maximum beneficial use of the waters of the Powder Basin will be for domestic and livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life purposes.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with ORS 536.300(2) pertaining to the water resources of the Powder Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Powder Basin, and attainment of an integrated and coordinated program for the benefit of the state as a whole will be futhered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and the waters of the Powder Basin are hereby so classified with the following exceptions:

1. That 65,000 acre-feet annually of unappropriated water of Eagle Creek and its tributaries at or above stream mile 21 be classified for domestic, livestock, municipal, irrigation, recreation, wildlife, and fish life purposes.

2. That 265,000 acre-feet annually of natural flows of Snake River water at or near stream mile 9 of Powder River (arm of Brownlee Reservoir) lying within Section 25, Township 9 South, Range 45 East, Willamette Meridian, be classified for domestic, livestock, municipal, irrigation and industrial purposes.

3. That 87,000 acre-feet annually of natural flows of Snake River water at or near stream mile 327 of Snake River lying within Section 8, Township 14 South, Range 45 East, Willamette Meridian, be classified for domestic, livestock, municipal, irrigation, and industrial purposes.

B. To support present and proposed Powder Basin resource developments no out-of-basin or out-of-state appropriations of water shall be made or granted by any state agency or public corporation of the state for the waters of Pine Creek, Eagle Creek, Powder River and Burnt River or their tributaries.

C. The maximum economic development of this state, the attainment of the highest and best use of the unappropriated waters of the natural lakes of the Powder Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development not to exceed 7 1/2 theoretical horsepower, recreation, wildlife, and fish life uses, and the waters of the natural lakes of the Powder Basin are hereby so classified.

D. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic, livestock, or municipal uses or waters to be legally stored or legally released from storage shall be made or granted by any state agency or public corporation of the state for the waters of:

1. Pine Creek and its tributaries above USGS - State Engineer's gage 13-2901.9 at stream mile 1.9 (NE 1/4 SW 1/4 Section 17, Township 7 South, Range 48 East) for flows of Pine Creek below 100 cubic feet per second for the period beginning March 1 and ending June 15, 40 cubic feet per second for the period beginning June 16 and ending the last day in February, measured at said gage and maintained to the mouth.

2. North Pine Creek and its tributaries above the mouth (SE 1/4 Section 34, Township 7 South, Range 47 East) for flows of North Pine Creek below

45 cubic feet per second for the period beginning March 1 and ending June 15, and 20 cubic feet per second for the period beginning June 16 and ending the last day in February, measured at or near the mouth.

3. East Pine Creek and its tributaries 0.5 mile above its confluence with Beecher Creek (NW 1/4 Section 15, Township 7 South, Range 46 East) for flows of East Pine Creek below 10 cubic feet per second for the period beginning March 1 and ending June 15, and five cubic feet per second for the period beginning June 16 and ending the last day in February, measured at or near said point and maintained to the mouth.

4. Clear Creek and its tributaries 0.75 mile above Twin Bridge Creek at stream mile 10.6 (NW 1/4 Section 8, Township 7 South, Range 46 East) for flows of Clear Creek below 25 cubic feet per second for the period beginning March 1 and ending June 15, and 15 cubic feet per second for the period beginning June 16 and ending the last day in February, measured at or near said point and maintained to the mouth.

5. Eagle Creek and its tributaries above USGS - State Engineer's Gage 13-2882 at stream mile 10.9 (SE 1/4 Section 7 Township 8 South, Range 45 East) for flows of Eagle Creek below 80 cubic feet per second for the period beginning March 1 and ending June 30, and 50 cubic feet per second for the period beginning July 1 and ending the last day in February, measured at or near said point.

6. East Fork Eagle Creek and its tributaries above the mouth (unsurveyed township) for flows of East Fork Eagle Creek below 45 cubic feet per second for the period beginning March 1 and ending June 30, and 23 cubic feet per second for the period beginning July 1 and ending the last day in February, measured at or near said point.

7. Eagle Creek and its tributaries above its confluence with East Fork Eagle Creek (unsurveyed township) for flows of Eagle Creek below 50 cubic feet per second for the period beginning March 1 and ending June 30, and 25 cubic feet per second for the period beginning July 1 and ending June 30, and 25 cubic feet per second for the period beginning July 1 and ending the last day in February, measured at or near said point.

8. West Fork Eagle Creek and its tributaries above its confluence with Trout Creek (NE 1/4 Section 9, Township 6 South, Range 43 East) for flows of West Fork Eagle Creek below 40 cubic feet per second for the period beginning March 1 and ending June 15, and 10 cubic feet per second for the period beginning June 16 and ending the last day in February measured at or near said point.

9. West Fork Eagle Creek and its tributaries above the mouth (NW 1/4 Section 28, Township 6 South, Range 43 East) for flows of West Fork Eagle Creek below five cubic feet per second for the period beginning March 1 and ending June 15, and two cubic feet per second for the period beginning June 16 and ending the last day in February, measured at or near the mouth.

10. Eagle Creek and its tributaries above its confluence with the West Fork Eagle Creek (NW 1/4 Section 28, Township 6 South, Range 43 East) for flows of Eagle Creek below 40 cubic feet per second for the period beginning March 1 and ending June 30, and 20 cubic feet per second for the period beginning July 1 and ending the last day in February, measured at or near said point.

11. Powder River below Mason Dam (NE 1/4 Section 25, Township 10 South, Range 38 East) at stream mile 139.5 for waters released from storage of up to 10 cubic feet per second measured at Mason Dam and maintained to Smith Diversion Dam at stream mile 128.1.

E. Application for the use of these specified waters of the Powder Basin shall not be accepted by any state agency for any other use and the granting of applications for such other use is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

F. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

G. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give cognizance to the multiple-purpose concept.

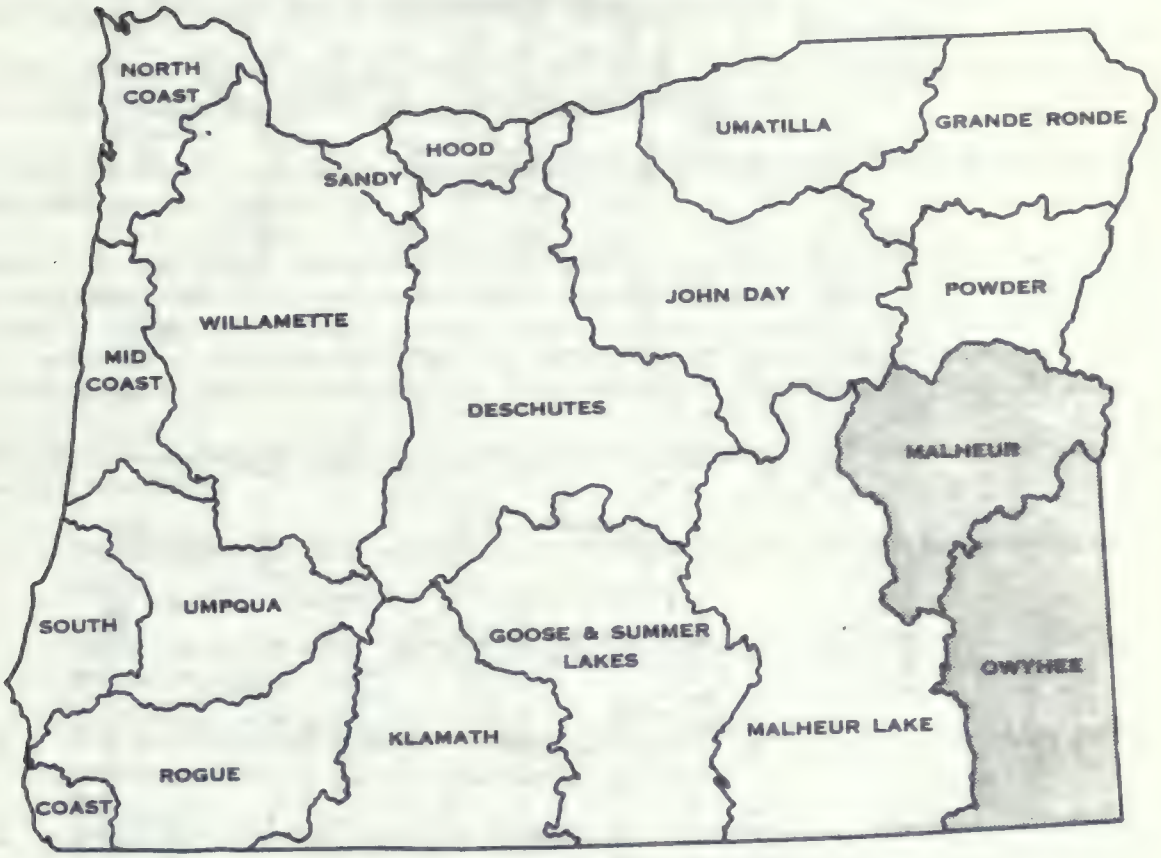
Done and dated this 4th day of April, 1981.

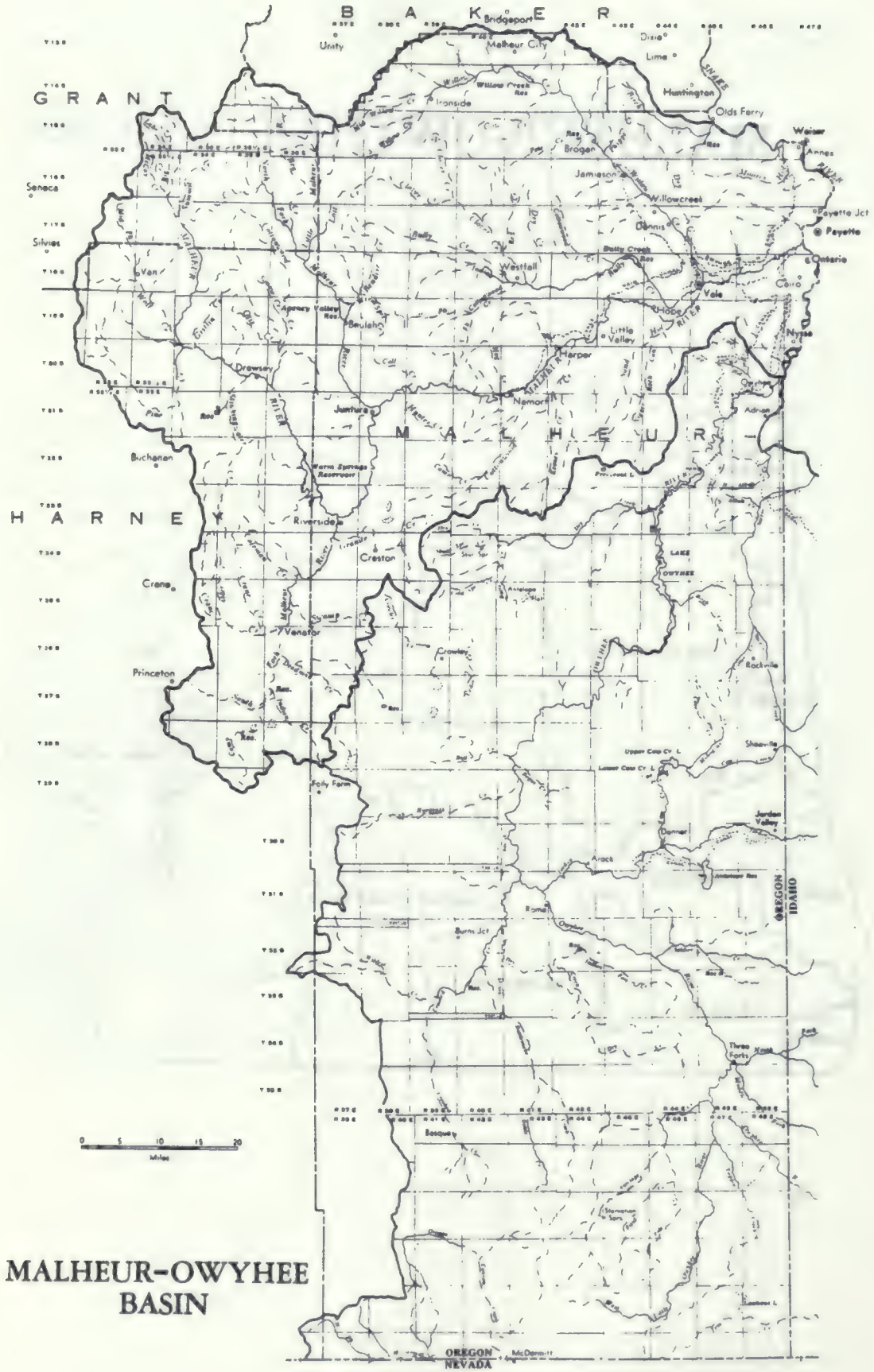
WATER POLICY REVIEW BOARD

By _____
Donel J. Lane, Chairman

4630A

MALHEUR-OWYHEE BASINS





MALHEUR-OWYHEE BASIN

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Malheur-Owyhee Basins	)))))	Malheur - Owyhee Basins April 4, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Malheur-Owyhee Basins as delineated on State Water Resources Board Map 10-11-6;

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Malheur-Owyhee Basins;

WHEREAS, this program does not modify, set aside or alter any existing rights to use water or the priority of such use established under existing law;

WHEREAS, results of this study have been published in the State Water Resources Board Report, Malheur-Owyhee Basins;

WHEREAS, in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources; and to existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, flood plains, and reservoir sites; and

WHEREAS, as a result of said study the following findings and conclusions have been reached by this Board:

1. The in-basins surface water supply is not adequate in most areas to satisfy the needs.

2. There is practically no unappropriated in-basins surface water during the irrigation season.

3. The ground water resource is appreciable and represents an important potential water source.

4. There are 290,400 acres of potentially irrigable land within the basins which have been identified plus large areas which have been less intensively surveyed.

5. Annual pumping requirements from the Snake River would average 1,454,000 acre-feet to adequately irrigate the presently irrigated and potentially irrigable land.

6. Long-range planning should also provide for using Snake River water on lower elevation irrigated lands.

7. Further knowledge of streamflows is required and would be aided by installing gages at key locations.

* Modifies Malheur-Owyhee Basin program dated October 23, 1970.

8. Domestic, livestock, municipal, industrial, power, mining, recreation, and wildlife uses represent comparatively small quantities of water in existing and contemplated future needs.

9. Industrial use of surface water is mainly for sand and gravel operations.

10. Irrigation use is over 95 percent of the total consumptive use of water and will continue to be the major consumptive use.

11. The physical and economic potential of hydroelectric power development is minor.

12. Fish life is and will continue to be an important nonconsumptive use of water.

13. Flooding is a serious local problem in the Vale-Ontario and Jordan Valley areas.

14. Erosion is a problem on 18,700 acres of cropland and 694,000 acres of range and pastureland.

15. Pollution of ground and surface water does not appear to be an extremely serious or widespread problem.

16. More efficient use and conservation of water could be obtained from extensive rehabilitation programs on most irrigated land and irrigation distribution facilities.

17. A conflict exists between flood control regulation and the use of water for irrigation, industrial, recreation, and fish life.

18. The mainstem of the South Fork of the Owyhee River from the Oregon - Idaho River border to Three Forks (the confluence of the North, Middle and South Forks Owyhee River) and the mainstem Owyhee River from Crooked Creek (river mile 22) to the mouth of Birch Creek (river mile 76) is designated by statute as a Scenic Waterway.

19. There are no statutory or State Engineer withdrawals on the use of water within the Malheur and Owyhee Basins.

20. The continued growth of the basins' economy is dependent upon the comprehensive multipurpose development of its water and related land resources.

21. The maximum benefical use of the waters of the Malheur-Owyhee Basins will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life purposes.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with ORS 536.300(2) pertaining to the water resources of the Malheur-Owyhee Basins:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Malheur-Owyhee Basins, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be futhered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life uses, and the waters of the Malheur-Owyhee Basins are hereby so classified with the following exceptions:

1. The maximum economic development of this state, the attainment of the highest and best use of the waters of the mainstem of the South Fork Owyhee River from the Oregon - Idaho border to Three Forks (the confluence of the North Middle and South Forks Owyhee River), and the main stem Owyhee River from Crooked Creek (river mile 22) to the mouth of Birch Creek (river mile 76), and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, industrial, mining, recreation, wildlife, and fish life uses and the aforementioned waters are hereby so classified.

2. The maximum economic development of this state, the attainment of the highest and best use of the waters of the natural lakes of the Malheur-Owynee Basins, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development, recreation, wildlife, and fish life uses, and the waters of the natural lakes of the Malheur-Owyhee Basins are hereby so classified.

B. Application for the use of these specified waters of the Malheur-Owyhee Basins shall not be accepted by any state agency for any other use and the granting of applications for such other use is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated and coordinated program for the use and control of the water resources of the state.

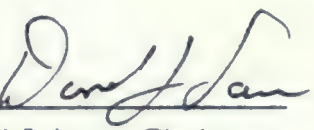
C. The maximum economic development of this state, the attainment of the highest and best use of 1,454,000 acre-feet annually of natural flows of the Snake River, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, and irrigation uses, and the 1,454,000 acre-feet annually of natural flows of the Snake River are hereby so classified.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give cognizance to the multiple-purpose concept.

Done and dated this 4th day of April, 1981

WATER POLICY REVIEW BOARD

By 

Donel J. Lane, Chairman

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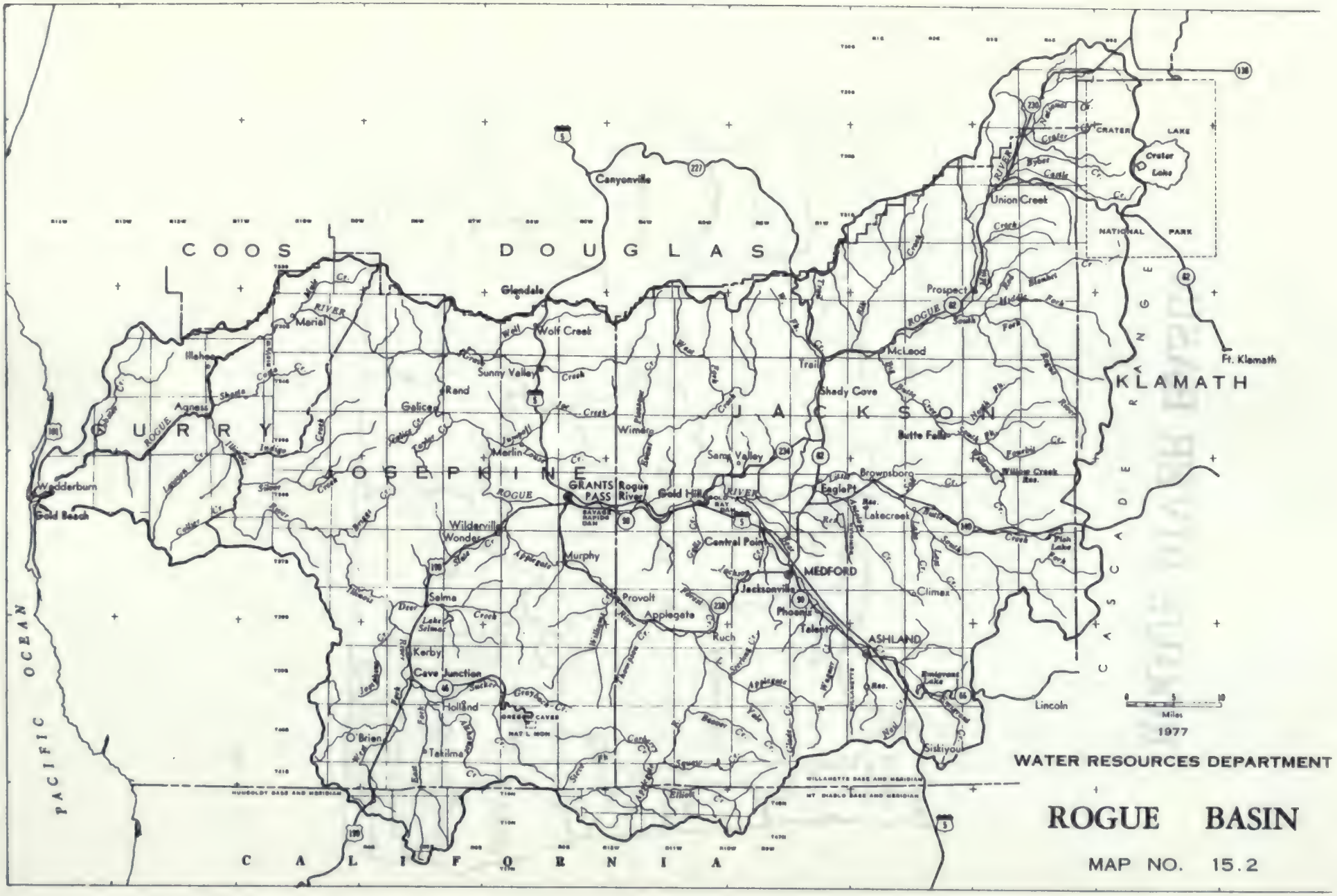
ROGUE RIVER BASIN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DOUGLAS
CURRY
JOSEPHINE
JACKSON
KLAMATH
CRATER LAKE NATIONAL PARK
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PACIFIC OCEAN
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Canyonville
Glendale
Union Creek
Prospect
McLeod
Ft. Klamath
Shady Cove
Butte Falls
Brownsboro
Eagle Pt
Lakecreek
Central Point
MEDFORD
Jacksonville
Phoenix
Talent
ASHLAND
Lincoln
Siskiyou
Gold Hill
GRANTS PASS
Rogue River
Wilderville
Murphy
Provolt
Applegate
Ruch
Sunny Valley
Rand
Gelica
Wolf Creek
Merlin
Wimer
Trail
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Merial
Wedderburn
Gold Beach
Selma
Kerby
Cave Junction
Holland
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WATER RESOURCES DEPARTMENT
ROGUE BASIN
MAP NO. 15.2

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Rogue River Basin	)))))	Rogue River Basin April 4, 1981*

WHEREAS House Joint Resolution 40, adopted by the Forty-Ninth regular session of the Legislative Assembly, directs the State Water Resources Board to undertake investigations, surveys, and studies necessary to formulate a state water policy for the Rogue River Basin and Watershed;

WHEREAS this resolution directed that these studies be undertaken in accordance with the provisions of ORS Chapter 536;

WHEREAS results of this study are published in the State Water Resources Board Report, Rogue River Basin;

WHEREAS in this study consideration was given to: means and methods of augmenting, conserving, and classifying such water resources; existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and for pollution abatement as well as other related subjects including drainage, reclamation and flood control;

WHEREAS the Water Policy Review Board, under the authority of ORS 536.340, may reclassify the water resources of the Rogue River Basin; and

WHEREAS as a result of said study, the following findings have been reached by this Board:

1. Future economic and population growth will depend upon the degree of utilization of natural resources. Since water is a controlling factor in resource development, the potential of the basin is based primarily on the quantity of water available for development use.

2. Total quantities of water are sufficient to satisfy all existing and presently contemplated needs and uses of water in the Rogue River Basin with the exception of utilization of water to minimize pollution.

3. Serious dislocations exist in terms of distribution of the resource in regard to physical location with respect to availability and time of need.

4. Major augmentation of the water resource in periods of need must come through storage of surplus runoff.

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* Modifies Rogue River Basin Programs dated October 12, 1959, April 3, 1964, February 24, 1966, November 2, 1966, and September 29, 1969.

5. Flows, unless augmented by storage, would not be sufficient on most streams during the summer months of low flow years to supply future consumptive and nonconsumptive demands exclusive of pollution abatement.

6. Depletion potentials on many streams, due to existing consumptive rights, are such that the simultaneous use of any major portion of existing rights could result in flows approaching the zero level during low flow periods.

7. Most streams in the system do not provide enough flow for nonconsumptive public use needs at present in periods of relatively low, as well as critical, flow.

8. Establishment of restrictions on further appropriations would aid in maintaining minimums where streams are not now appropriated beyond their natural capacity at critical periods.

9. Where streams are seasonally overappropriated, the establishment of restrictive actions would have no major practical effect until additional flows became available from return flows of major upstream developments or from storage.

10. Certain major sections and numerous minor streams and creeks are by nature of their topography, location, ownership, or economic potential, available only for limited resource uses.

11. It is imperative that single-purpose storage developments do not preclude full utilization of the resources.

12. Legal restrictions in the form of statutory and State Engineer's withdrawals, unless amended or rescinded, will preclude the attainment of maximum beneficial use of the waters.

13. Maximum beneficial use of the waters of the mainstem of the Rogue River will assist in economic development of the basin.

14. There is need to insure quantities of water sufficient for domestic and municipal uses which, while small, are of great benefit to the state.

15. Adequately irrigated agricultural lands in the basin represent only a small percentage of the total potentially irrigable area.

16. Maximum beneficial use of water for irrigation would be achieved through more efficient use of presently available water.

17. The basin has substantial potential for the development of hydroelectric energy.

18. The basin has substantial potential for the development of industry.

19. Use of water in the basin for mining purposes is slight and generally nonconsumptive.

20. Mining requirements should not materially increase above the present level of rights.

21. Recreation is a major industry in the Rogue River Basin.

22. The Rogue River from its confluence with the Applegate River (river mile 95) to Lobster Creek Bridge (river mile 11) is a designated State Scenic Waterway.

23. Plans for the development of sites should recognize the increasing expansion of outdoor recreation.

24. There is need to develop satisfactory sites and facilities for the pursuance of water-type recreational activities.

25. Water consumption by wildlife does not represent a significant quantity.

26. Maintenance of minimum perennial streamflows sufficient to support aquatic life and minimize pollution would be in the public interest.

27. The fishery management program of the basin, recreational potentials, minimization of pollution, and other public uses will be enhanced through attainment of desirable base flows from storage.

28. Desirable base flows suggested by fisheries agencies are substantially higher than the flow levels attainable with current stream regimen, rights, and priorities at many critical locations during a mean water year.

29. Storage of winter runoff and scheduled releases of stored water or purchase of sufficient existing consumptive rights will be necessary to attain the flows recommended by the fisheries agencies.

30. Criteria for determination of desired base flows commensurate with all beneficial uses of water have not been developed. This matter is under continuing study by the Water Policy Review Board.

31. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

32. Drainage of lands in many areas in the basin will bring economic benefit to the state.

33. Flood control is an item of major interest and of great economic importance to the public.

34. Development is continuing to take place in the flood plains. Effective control of floods will require storage even though local flood protective works may reduce damage.

35. Major future uses of water in the Rogue River Basin should be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife, and fish life.

36. Physical features, degree of economic development, and water use requirements vary from subbasin to subbasin.

NOW THEREFORE BE IT RESOLVED that for reason of variance in physical features, degree of economic development, and water use requirements from subbasin to subbasin, the Board adopts the following findings and issues program statements for each of the subbasins in the Rogue River Basin:

UPPER ROGUE RIVER BASIN

WHEREAS the State Water Resources Board under the directive of House Joint Resolution 40, Forty-Ninth Legislative Assembly, in accordance with the standards of ORS 536.300, has undertaken a study of the Upper Rogue River Basin which includes all of the drainage area of the Rogue River and its tributaries above river mile 133 at the south line of Section 31, Township 35 South, Range 1 West, Willamette Meridian;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources to existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of such studies, the following findings have been reached by this Board:

1. Total quantities of water are sufficient to satisfy all existing and presently contemplated needs and uses of water with the exception of utilization of flows to minimize pollution.

2. It is imperative that single-purpose storage developments do not preclude full utilization of the resource.

3. Attainment of maximum beneficial use of the waters is precluded unless statutory and State Engineer's withdrawals are amended or rescinded.

4. Domestic use, while small, represents an important factor in existing and presently contemplated needs and uses of water.

5. Municipal requirements represent an important factor in existing and presently contemplated needs and uses of water.

6. Irrigation is a significant factor in existing and presently contemplated needs and uses of water.

7. Potential for hydroelectric power development exists in the Upper Rogue River Basin.

8. Industrial requirements do not represent a significant factor in existing or presently contemplated needs and uses of water. Statutory restrictions preclude appropriation of water for industrial purposes from the main stem of the Rogue River below river mile 146.8.

9. Mining does not represent a significant factor in existing and presently contemplated needs and uses of water.

10. Recreation use represents and will continue to bring substantial benefits to the state.

11. Fish and wildlife uses represent and will continue to bring substantial benefits to the state.

12. Maintenance of minimum perennial streamflow sufficient to support aquatic life and minimize pollution would be in the public interest.

13. Attainment of increased flows from storage for enhancement of fish life, recreational potentials, and minimization of pollution, would be in the public interest.

14. Desirable base flows suggested by fisheries agencies are substantially higher than flow levels attainable with current stream regimen, rights and priorities at many critical locations during a mean water year.

15. Storage of winter runoff and scheduled releases of stored water or purchase of sufficient existing consumptive rights will be necessary to attain the flows recommended by fisheries agencies.

16. Criteria for determination of desired base flows commensurate with all beneficial uses of water have not been developed. This matter is under continuing study by the Water Policy Review Board.

17. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

18. Drainage and reclamation of drained lands are not significant factors in existing and presently contemplated water use.

19. Control of floods is an item of economic importance to the state.

20. Maximum beneficial use of the waters of the Upper Rogue River Basin will be for domestic, livestock, municipal, irrigation, temperature control, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with ORS 536.300(2) pertaining to the water resources of the Upper Rogue River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Upper Rogue River Basin and the attainment of an integrated, coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, temperature control, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the Upper Rogue River Basin are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and minimize pollution, no appropriations of water shall be made or granted by any state agency or public corporation of the state for the waters of the Rogue River or its tributaries above river mile 164 for flows of the Rogue River at river mile 164 below 835 cubic feet per second, except that this limitation shall not apply to:

1. Water legally stored or legally released from storage.

2. Domestic and livestock uses from the tributaries of the Rogue River.

3. Domestic, livestock and irrigation uses not to exceed one acre in area per appropriator from the main stem Rogue River.

C. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with recreational, fish life or other beneficial uses of water.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

LITTLE BUTTE CREEK BASIN

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Little Butte Creek Basin;

WHEREAS in this study consideration was given to: means and methods of augmenting, conserving, and classifying such water resources; existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and for pollution abatement as well as other related subjects including drainage, reclamation and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Little Butte Creek Basin;

WHEREAS as a result of such studies the following findings have been reached by this Board:

1. Total quantities of water are sufficient to satisfy all existing and presently contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. There are serious geographical and seasonal deficiencies in water supply.

3. Flows during the summer months are inadequate to satisfy existing needs.

4. It is imperative that single-purpose developments do not preclude full utilization of the resource.

5. Attainment of maximum beneficial use of water is precluded unless the State Engineer's withdrawals are amended or rescinded.

6. Domestic use, while small, represents a significant factor in existing and presently contemplated needs and uses of water.

7. Municipal use does not represent a significant factor in existing and presently contemplated needs and uses of water.

8. Irrigation will be a significant factor in presently contemplated needs and uses of water.

9. Power does not represent a significant factor in existing and presently contemplated needs and uses of water.

10. Industrial use does not represent a significant factor in presently contemplated future needs of water.

11. Mining does not represent a significant factor in existing and presently contemplated future need and uses of water.

12. Recreation from regulated streamflow will be a significant factor in presently contemplated future needs and uses of water.

13. Fish and wildlife uses represent and will continue to bring benefits to the state.

14. Maintenance of minimum perennial streamflow sufficient to support aquatic life and minimize pollution would be in the public interest.

15. Attainment of increased flows from storage for enhancement of fish life, recreational potentials, and minimization of pollution, would be in the public interest.

16. Desirable base flows suggested by fisheries agencies are substantially higher than the flow levels attainable with current stream regimen, rights, and priorities at many critical locations during a mean water year.

17. Storage of winter runoff and scheduled releases of stored water or purchase of sufficient existing rights will be necessary to attain the flows recommended by the fisheries agencies.

18. Criteria for determination of desired base flows commensurate with all beneficial uses of water have not been developed. This matter is under continuing study by the Water Policy Review Board.

19. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

20. Drainage of land in some areas will bring economic benefit to the state.

21. Control of floods in the lower portion of the basin is an item of economic importance to the state.

22. Maximum beneficial use of the waters of the Little Butte Creek Basin will be for domestic, livestock, irrigation, temperature control, power development, recreation, wildlife, and fish life purposes.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Little Butte Creek Basin:

A. The maximum economic development of this state and the attainment of the highest and best use of waters of the Little Butte Creek Basin and the attainment of an integrated and coordinated program for the benefit of the state will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation, temperature control, power development, recreation, wildlife, and fish life purposes and the waters of the Little Butte Creek Basin are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and minimize pollution, no appropriations of water except for domestic or livestock use shall be made or granted by any state agency or public corporation of the state, except that this limitation shall not apply to water legally released from storage, for the waters of:

1. Little Butte Creek or its tributaries above the mouth (SW 1/4 Section 7, Township 36 South, Range 1 West) for flows of Little Butte Creek below: 60 cubic feet per second for the period beginning May 1 and ending June 30, 20 cubic feet per second for the period beginning July 1 and ending August 31, 120 cubic feet per second for the period beginning September 1 and ending October 31, and 100 cubic feet per second for the period beginning November 1 and ending April 30, measured at or near the mouth.

2. Antelope Creek or its tributaries above the mouth (NW 1/4 Section 9, Township 36 South, Range 1 West) for flows of Antelope Creek below: 10 cubic feet per second for the period beginning May 1 and ending May 31, 5 cubic feet per second for the period beginning June 1 and ending September 15, 20 cubic feet per second for the period beginning September 16 and ending October 31, and 25 cubic feet per second for the period beginning November 1 and ending April 30, measured at or near the mouth.

3. Lake Creek or its tributaries above the mouth (SE 1/4 Section 19, Township 36 South, Range 2 East) for flows of Lake Creek below: 4 cubic feet per second for the period beginning May 1 and ending May 31, 1 cubic foot per second for the period beginning June 1 and ending September 15, 8 cubic feet per second for the period beginning September 16 and ending October 31, and 12 cubic feet per second for the period beginning November 1 and ending April 30, measured at or near the mouth.

4. South Fork Little Butte Creek or its tributaries above USGS Gage No. 14-3415 (SE 1/4 Section 29, Township 36 South, Range 2 East) for flows of South Fork Little Butte Creek below: 30 cubic feet per second for the period beginning May 1 and ending June 30, 20 cubic feet per second for the period beginning July 1 and ending September 15, 50 cubic feet per second for the period beginning September 16 and ending October 31, and 70 cubic feet per second for the period beginning November 1 and ending April 30, measured at or near the mouth.

C. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of such applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

D. Structures or works for the utilization of the waters in accordance with the aforementioned classifications, are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

BEAR CREEK BASIN

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Bear Creek Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources to existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Bear Creek Basin;

WHEREAS as a result of such studies the following findings have been reached by this Board:

1. Total quantities of water are not sufficient to satisfy all existing and presently contemplated needs and uses of water.

2. Any significant expansion of consumptive use will intensify shortages during low flow periods of the summer months.

3. Attainment of maximum beneficial use of water is precluded unless State Engineer's withdrawals are amended or rescinded.

4. Domestic use, while small, represents a significant factor in existing and presently contemplated needs and uses of water.

5. Municipal requirements, while small, represent a significant factor in existing and presently contemplated needs and uses of water.

6. Irrigation represents a significant factor in existing and presently contemplated needs and uses of water.

7. Power does not represent a significant factor in existing and presently contemplated needs and uses of water.

8. Future major water-using industries, because of limitation on supply, will be forced to utilize waters from other subbasins.

9. Mining does not represent a significant factor in existing and presently contemplated needs and uses of water.

10. Utilization of regulated flows for recreation would be a significant factor in presently contemplated needs and uses of water.

11. Water consumption by wildlife does not represent a significant quantity.

12. Enhancement of fish life will be difficult to attain because of the lack of flows in Bear Creek main stem.

13. Attainment of increased flows from storage for enhancement of fish life, recreational potential, and minimization of pollution, would be in the public interest.

14. Desirable base flows suggested by fisheries agencies are substantially higher than flow levels attainable with current stream regimen, rights and priorities at many critical locations during a mean water year.

15. Storage of winter runoff and scheduled releases of stored water or purchase of sufficient existing consumptive rights will be necessary to attain the flows recommended by fisheries agencies.

16. Criteria for determination of desired base flows commensurate with all beneficial uses of water have not been developed. This matter is under continuing study by the Water Policy Review Board.

17. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

18. Drainage of land in some areas will bring economic benefit to the state.

19. Control of floods would bring substantial benefits to the state.

20. The maximum beneficial use of the waters of Bear Creek Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life purposes.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with ORS 536.300(2) pertaining to the water resources of the Bear Creek Basin:

A. No applications for appropriation of water shall be accepted or issued by any state agency except for power development and appropriations for beneficial use involving water legally stored in excess of the amount necessary for existing rights.

B. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with recreational, fish life, or other beneficial uses of water.

C. Rights to use of water for power development purposes granted by any state agency shall be issued only on the condition, as demonstrated by the applicant, that any dams, diversions, generating facility, or return flows shall not interfere with recreational, fish life or other beneficial uses of water.

D. Structures or works for the utilization of the waters in accordance with the aforementioned classifications, are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

APPLEGATE RIVER BASIN

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Applegate River Basin;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources to existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS as a result of such studies the following findings have been reached by this Board:

1. Total quantities of water are sufficient to satisfy all existing and presently contemplated needs and uses of water with the exception of utilization of flows to minimize pollution.

2. There are serious geographical and seasonal deficiencies in water supply.

3. Flows during the summer months are inadequate in many areas to satisfy existing needs.

4. Attainment of quantities of water to satisfy all beneficial use requirements will be achieved only through storage.

5. Domestic requirements, while small, represent a significant factor in existing and presently contemplated needs and uses of water.

6. Municipal requirements do not represent a significant factor in existing and presently contemplated needs and uses of water.

7. There is substantial irrigation potential in the basin.

8. Development of the irrigation potential will be a significant factor in future water use and will bring substantial benefits to the state.

9. Power does not represent a significant factor in existing and presently contemplated needs and uses of water.

10. Industrial use requirements are not a significant factor in existing and presently contemplated needs and uses of water.

11. Mining requirements should not materially increase above the present level of rights.

12. Water-based recreation from regulated streamflow would represent a significant factor in presently contemplated needs and uses of water.

13. Fish and wildlife uses represent and will continue to bring benefits to the state.

14. Water consumption by wildlife does not represent a significant quantity.

15. Minimum streamflows are not sufficient to support aquatic life.

16. Maintenance of minimum perennial streamflows sufficient to support aquatic life and minimize pollution would be in the public interest.

17. Attainment of increased flows from storage for enhancement of fish life, recreational potential, and minimization of pollution, would be in the public interest.

18. Desirable base flows suggested by fisheries agencies are substantially higher than flow levels attainable with current stream regimen, rights, and priorities at many critical locations during a mean water year.

19. Storage of winter runoff and scheduled releases of stored water or purchase of sufficient existing consumptive rights will be necessary to attain the flows recommended by fisheries agencies.

20. Criteria for determination of desired base flows commensurate with all beneficial uses of water have not been developed. This matter is under continuing study by the Water Policy Review Board.

21. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

22. Drainage and reclamation of drained lands are not present or contemplated significant factors in water use.

23. Control of floods is an item of economic importance to the state.

24. Adequate control of floods and reduction of flood damage require both local protective works and storage.

25. The maximum beneficial use of the waters of the Applegate River Basin will be for domestic, livestock, irrigation, power development, industrial, mining, recreation, wildlife and fish life purposes.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Applegate River Basin:

A. The maximum economic development of this state and the attainment of the highest and best use of the waters of the Applegate River Basin and the attainment of an integrated and coordinated program for the benefit of the state will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation, power development, industrial, mining, recreation, wildlife and fish life purposes and the waters of the Applegate River Basin are hereby so classified.

B. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

C. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with recreational, fish life, or other beneficial uses of water.

D. Structures or works for the utilization of the waters in accordance with the aforementioned classifications, are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

MIDDLE ROGUE RIVER BASIN

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Middle Rogue River Basin which includes all that part of the drainage area, Rogue River and its tributaries, which are tributary to Rogue River between river mile 68, just below the mouth of Grave Creek, and river mile 133 at the south line of Section 31, Township 35 South, Range 1 West, Willamette Meridian, excepting therefrom the drainage basins of Little Butte Creek, Bear Creek, and Applegate River;

WHEREAS in this study consideration was given to means and methods of augmenting, conserving, and classifying such water resources to existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses, and for pollution abatement as well as other related subjects including drainage, reclamation, and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Middle Rogue River Basin;

WHEREAS as a result of such studies the following findings have been reached by this Board:

1. Total quantities of water are sufficient to satisfy all existing and presently contemplated needs and uses of water with the exception of utilization of flows to minimize pollution.

2. Maximum beneficial use of the waters of the Middle Rogue River Basin will assist in economic development of the basin.

3. Domestic use, while small, represents a significant factor in existing and presently contemplated needs and uses of water.

4. Municipal requirements, while small, represent a significant factor in existing and presently contemplated needs and uses of water.

5. Irrigation represents a significant factor in existing and presently contemplated needs and uses of water.

6. There is limited power potential existing in the Middle Rogue River Basin.

7. There is potential for the utilization of water for industrial purposes from the main stem of the Rogue River below river mile 146.8.

8. Mining requirements should not materially increase above the present level of rights.

9. Recreation use represents and will continue to bring substantial benefits to the state.

10. The Rogue River main stem from its confluence with the Applegate River (river mile 95) to Lobster Creek Bridge (river mile 11) is a designated State Scenic Waterway.

11. Fish and wildlife uses represent and will continue to bring substantial benefits to the state.

12. Maintenance of minimum perennial streamflows sufficient to support aquatic life and minimize pollution would be in the public interest.

13 Attainment of increased flows from storage for enhancement of fish life, recreational potential, and minimization of pollution, would be in the public interest.

14. Desirable base flows suggested by fisheries agencies are substantially higher than flow levels attainable with current stream regimen, rights, and priorities of many critical locations during a mean water year.

15. Storage of winter runoff and scheduled releases of stored water or purchase of sufficient existing rights will be necessary to attain the flows recommended by fisheries agencies.

16. Criteria for determination of desired base flows commensurate with all beneficial uses of water have not been developed. This matter is under continuing study by the Water Policy Review Board.

17. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

18. Drainage of land in some areas will bring economic benefit to the state.

19. Control of floods is an item of economic importance to the state.

20. Adequate control of floods and reduction of damage requires both local protective works and storage.

21. The maximum beneficial use of the waters of the Middle Rogue River Basin will be for domestic, livestock, municipal, irrigation, power development, temperature control, industrial, mining, recreation, wildlife, and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the waters of the Middle Rogue River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Middle Rogue River Basin and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, temperature control, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the Middle Rogue River are hereby so classified with the following exception:

The maximum economic development of this state, the attainment of the highest and best use of waters of the Rogue River main stem from its confluence with the Applegate River to Lobster Creek Bridge, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, irrigation, temperature control, industrial, mining, recreation, wildlife and fish life uses, and the aforementioned are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and minimize pollution, no appropriations of water shall be made or granted by any state agency or public corporation of the state for the waters of the Rogue River or its tributaries above Raygold for flows of the Rogue River below 1200 cubic feet per second, except that this limitation shall not apply to:

1. Waters legally stored or legally released from storage.

2. Domestic and livestock uses from the tributaries of the Rogue River.

3. Domestic, livestock and irrigation uses not to exceed one acre in area per appropriator from the main stem Rogue River.

C. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and minimize pollution, no appropriations of water shall be made or granted by any state agency or public corporation of the state for the waters of the Rogue River or its tributaries above Savage Rapids Dam for flows of the Rogue River below 1,200 cubic feet per second, except that this limitation shall not apply to:

1. Water legally stored or legally released from storage.

2. Domestic and livestock uses from the tributaries of the Rogue River.

3. Domestic, livestock and irrigation uses not to exceed one acre in area per appropriator from the mainstem Rogue River.

D. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and minimize pollution, no appropriations of water except for domestic or livestock use shall be made or granted by any state agency or public corporation of the state, except that this limitation shall not apply to water legally stored or legally released from storage, for the waters of:

1. Grave Creek or its tributaries above the confluence of Wolf Creek (NW 1/4 Section 1, Township 34 South, Range 7 West) for flows of Grave Creek below: 40 cubic feet per second for the period beginning May 1 and ending June 30, 5 cubic feet per second for the period beginning July 1 and ending September 15, 40 cubic feet per second for the period beginning September 16 and ending October 31, and 80 cubic feet per second for the period beginning November 1 and ending April 30, measured at or near the confluence of Grave and Wolf Creeks.

2. Wolf Creek or its tributaries above the mouth (NW 1/4 Section 1, Township 34 South, Range 7 West) for flows of Wolf Creek below: 15 cubic feet per second for the period beginning May 1 and ending June 30, 1 cubic foot per second for the period beginning July 1 and ending September 30, 18 cubic feet per second for the period beginning October 1 and ending November 30, and 25 cubic feet per second for the period beginning December 1 and ending April 30, measured at or near the mouth.

3. Fruitdale Creek or its tributaries above the mouth (SW 1/4 Section 21, Township 36 South, Range 5 West) for flows of Fruitdale Creek below: 2 cubic feet per second for the period beginning May 1 and ending May 31, 1 cubic foot per second for the period beginning June 1 and ending September 15, and 4 cubic feet per second for the period beginning September 16 and ending April 30, measured at or near the mouth.

4. Sardine Creek or its tributaries above the mouth (SE 1/4 Section 17, Township 36 South, Range 3 West) for flows of Sardine Creek below: 4 cubic feet per second for the period beginning May 1 and ending May 31, 1 cubic foot per second for the period beginning June 1 and ending September 15, 8 cubic feet per second for the period beginning September 16 and ending October 31, and 12 cubic feet per second for the period beginning November 1 and ending April 30, measured at or near the mouth.

5. Kane Creek or its tributaries above the confluence of Blackwell Creek (NW 1/4 Section 22, Township 36 South, Range 3 West) for flows of Kane Creek below: 2 cubic feet per second for the period beginning May 1 and ending May 31, 1 cubic foot per second for the period beginning June 1 and ending September 30, and 4 cubic feet per second for the period beginning October 1 and ending April 30, measured at or near the confluence of Kane and Blackwell Creeks.

6. Sams Creek or its tributaries above the mouth (SW 1/4 Section 1 Township 36 South, Range 3 West) for flows of Sams Creek below: 2 cubic feet per second for the period beginning May 1 and ending May 31, 1 cubic foot per second for the period beginning June 1 and ending September 15, 2 cubic feet per second for the period beginning September 16 and ending October 15, and 5 cubic feet per second for the period beginning October 16 and ending April 30, measured at or near the mouth.

E. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, co-ordinated program for the use and control of the water resources of the state.

F. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with recreational, fish life or other beneficial uses of water.

G. Structures or works for the utilization of the waters in accordance with the aforementioned classifications, are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

ILLINOIS RIVER BASIN

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Illinois River Basin;

WHEREAS in this study consideration was given to: means and methods of augmenting, conserving, and classifying such water resources; existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and for pollution abatement as well as other related subjects including drainage, reclamation and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Illinois River Basin;

WHEREAS as a result of such studies the following findings have been reached by this Board:

1. Total quantities of water are sufficient to satisfy all existing and presently contemplated needs and uses of water with the exception of utilization of water to minimize pollution.

2. There are serious geographical and seasonal deficiencies in water supply.

3. Flows during the summer months are not adequate to satisfy existing needs.

4. Attainment of quantities of water to satisfy all beneficial use requirements will be achieved only through storage.

5. Domestic requirements, while small, represent a significant factor in existing and presently contemplated needs and uses of water.

6. Municipal requirements, while small, represent a significant factor in existing and presently contemplated needs and uses of water.

7. There is substantial irrigation potential in the basin.

8. Development of the irrigation potential will be a significant factor in future water use and will bring benefits to the state.

9. There is power potential existing on the Illinois River.

10. Industrial requirements are not a significant factor in existing and presently contemplated needs and uses of water.

11. Mining requirements should not materially increase above the present level of rights.

12. Recreation from unregulated streams will not be a significant factor in presently contemplated needs and uses of water.

13. Fish life and wildlife uses represent and will continue to bring substantial benefits to the state.

14. The Illinois River from its confluence with Deer Creek to its confluence with the Rogue River is a designated State Scenic Waterway.

15. Maintenance of minimum perennial streamflows sufficient to support aquatic life and minimize pollution will be in the public interest.

16. Attainment of increased flows from storage for enhancement of fish life, recreation potentials, and minimization of pollution, would be in the public interest.

17. Desirable base flows suggested by fisheries agencies are substantially higher than flow levels attainable with current stream regimen, rights, and priorities at many critical locations during a mean water year.

18. Storage of winter runoff and scheduled releases of stored water or purchase of sufficient existing rights will be necessary to attain the flows recommended by fisheries agencies.

19. Criteria for determination of desired base flows commensurate with all beneficial uses of water have not been developed. This matter is under continuing study by the Water Policy Review Board.

20. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

21. Drainage and reclamation of drained lands are not significant factors in existing or presently contemplated needs for water control.

22. The control of floods is a matter of economic importance to the state.

23. Adequate control of floods and reduction of damages require both local protective works and storage.

24. The maximum beneficial use of the waters of the Illinois River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Illinois River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Illinois River Basin and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the Illinois River Basin are hereby so classified with the following exception:

> The maximum economic development of this state, the attainment of the highest and best use of the waters of the Illinois River from its confluence with Deer Creek (river mile 47) to its confluence with the Rogue River and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, industrial, mining, recreation, wildlife and fish life uses, and the waters of the above segment of the Illinois River are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and minimize pollution, no appropriations of water except for domestic and livestock use shall be made or granted by any state agency or public corporation of the state for the waters of the Illinois River or its tributaries above its confluence with the Rogue River for flows of the Illinois River at its mouth below 80 cubic feet per second except that this limitation shall not apply to water legally stored or legally released from storage.

C. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluents or return flows from such uses shall not interfere with recreational, fish life, or other beneficial uses of water.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications, are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

LOWER ROGUE RIVER BASIN

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Lower Rogue River Basin which includes all that part of the drainage area of Rogue River and its tributaries, which are tributary to Rogue River between its mouth and river mile 68, just below the mouth of Grave Creek, excepting therefrom the drainage basin of the Illinois River;

WHEREAS in this study consideration was given to: means and methods of augmenting, conserving, and classifying such water resources; existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and for pollution abatement as well as other related subjects including drainage, reclamation and flood control; and

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Lower Rogue River Basin;

WHEREAS as a result of such studies the following findings have been reached by this Board:

1. Total quantities of water are sufficient to satisfy all existing and presently contemplated needs and uses of water except for utilization of flows to minimize pollution.

2. Flows during the summer months are inadequate to supply desired base flows for fish life.

3. Domestic requirements, while small, represent a significant factor in existing and presently contemplated needs and uses of water.

4. Municipal requirements, while small, represent a significant factor in existing and presently contemplated needs and uses of water.

5. Irrigation does not represent a significant factor in existing and presently contemplated needs and uses of water.

6. There is substantial power potential in this basin, but development of this power potential would seriously interfere with the passage of anadromous fish.

7. Industrial use represents a significant factor in presently contemplated needs and uses of water. Statutory restrictions preclude appropriation of water for industrial purposes from the main stem of the Rogue River below river mile 146.8.

8. Mining does not represent a significant factor in existing and presently contemplated needs and uses of water.

9. Recreation represents a significant factor in existing and presently contemplated needs and uses of water.

10. The Rogue River main stem from its confluence with Applegate River (river mile 95) to Lobster Creek Bridge (river mile 11) is a designated State Scenic Waterway.

11. Fish life and wildlife represent and will continue to bring substantial benefits to the state.

12. Maintenance of minimum perennial streamflows sufficient to support aquatic life and minimize pollution would be in the public interest.

13. Attainment of increased flows from storage for enhancement of fish life, recreational potentials, and minimization of pollution would be in the public interest.

14. Desirable base flows suggested by fisheries agencies are substantially higher than flow levels attainable with current stream regimen, rights, and priorities at many critical locations during a mean water year.

15. Storage of winter runoff and scheduled releases of stored water or purchase of sufficient existing rights will be necessary to attain the flows recommended by fisheries agencies.

16. Criteria for determination of desired base flows commensurate with all beneficial uses of water have not been developed. This matter is under continuing study by the Water Policy Review Board.

17. Utilization of flows to minimize pollution should not be permitted if such use limits or conflicts with the multiple-purpose concept.

18. Drainage and reclamation of drained lands are not significant factors in existing and presently contemplated needs for water control.

19. Control of floods is a matter of economic importance to the state.

20. Adequate control of floods and reduction of damages require both local protective works and storage.

21. The maximum beneficial use of the waters of the Lower Rogue River Basin will be for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Lower Rogue River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Lower Rogue River Basin and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and the waters of the Lower Rogue River Basin are hereby so classified with the following exception:

The maximum economic development of this state, the attainment of the highest and best use of the waters of the Rogue River mainstem from river mile 95 to Lobster Creek Bridge (river mile 11) and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, industrial, mining, recreation, wildlife and fish life uses and the aforementioned waters of the Rogue River are hereby so classified.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and minimize pollution, no appropriations of water shall be made or granted by any state agency or public corporation of the state for the waters of the Rogue River or its tributaries above its mouth for flows of the Rogue River at its mouth below 935 cubic feet per second, except that this limitation shall not apply to:

1. Water legally stored or legally released from storage.

2. Domestic and livestock uses from the tributaries of the Rogue River.

3. Domestic, livestock and irrigation uses not to exceed one acre in area per appropriator from the main stem Rogue River.

C. Applications for the use of such water shall not be accepted by any state agency for any other purpose and the granting of applications for such other purposes is declared to be prejudicial to the public interest and the granting of applications for such other uses would be contrary to the integrated, coordinated program for the use and control of the water resources of the state.

D. Rights to use of water for industrial or mining purposes granted by any state agency shall not interfere with recreational, fish life, or other beneficial uses of water.

E. Structures or works for the utilization of the waters in accordance with the aforementioned classifications, are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with applicable provisions of ORS 536.310 and any such structures or works are further declared to be prejudicial to the public interest which do not give proper cognizance to the multiple-purpose concept.

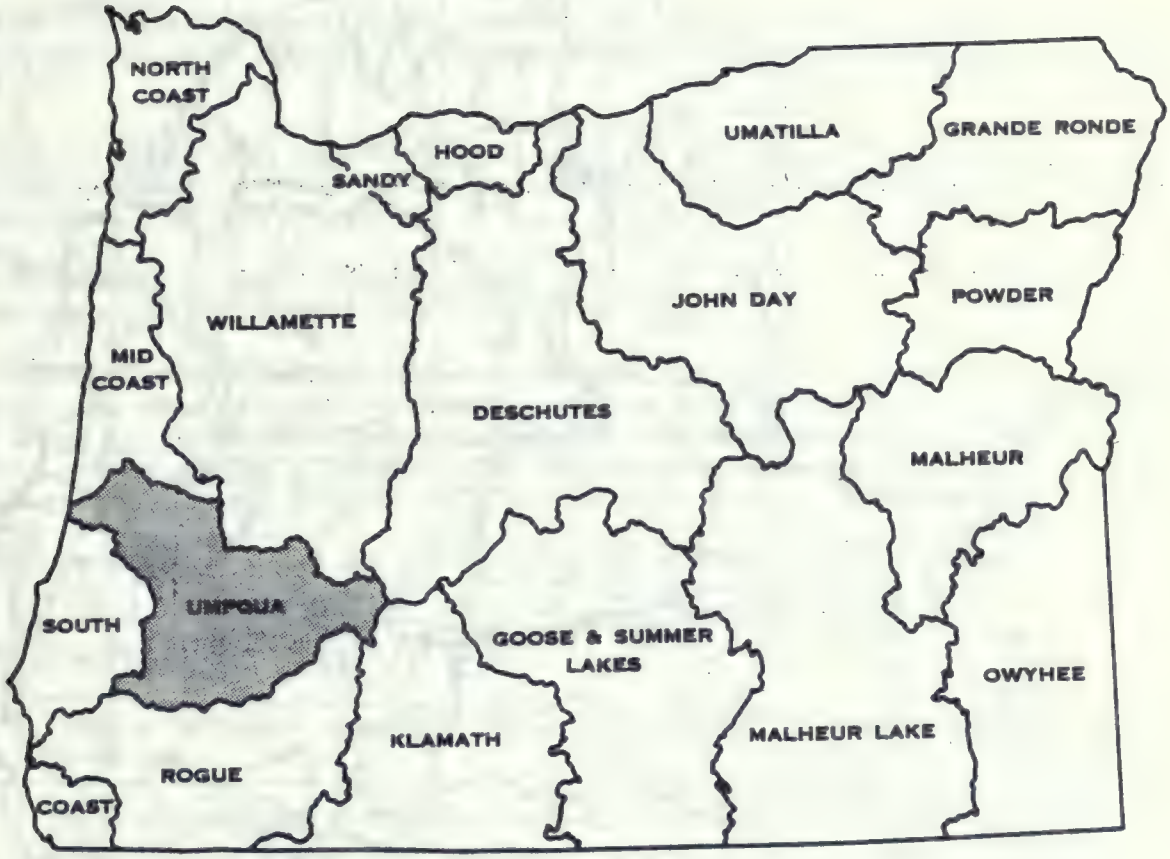
Done and dated this 4th day of April, 1981.

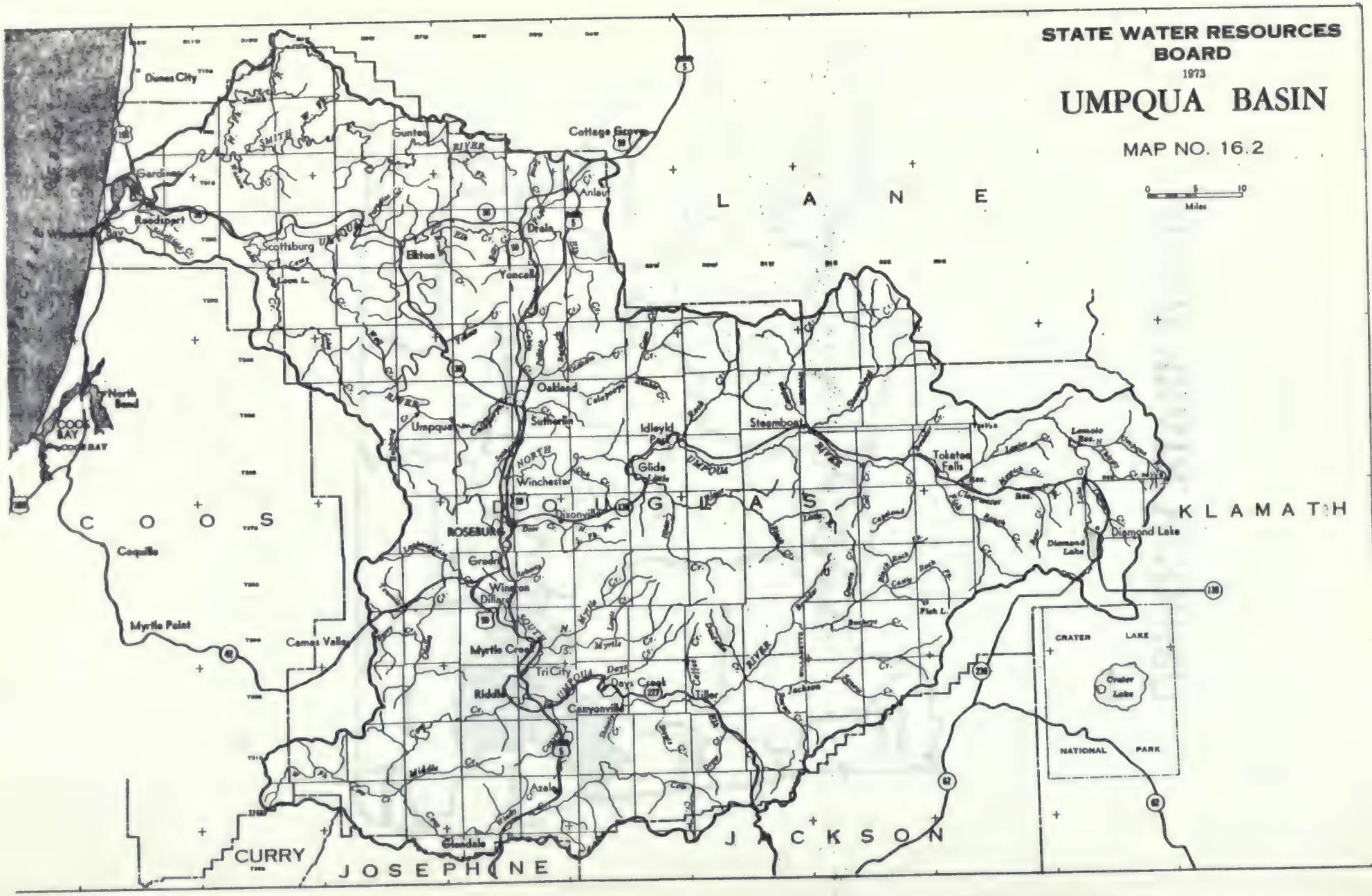
WATER POLICY REVIEW BOARD

By _____
Donel J. Lane, Chairman

4806A

UMPQUA RIVER BASIN




STATE WATER RESOURCES BOARD
1973
UMPQUA BASIN
MAP NO. 16.2
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Miles
LANE
DOUGLAS
COOS
CURRY
JOSEPHINE
JACKSON
KLAMATH
Dunes City
Cottage Grove
Gardiner
Reedsport
Scottsburg
Elkton
Drain
Yoncalla
Oakland
Sutherlin
Umpqua
Winchester
Idleyld Park
Glide
Steamboat
Toketee Falls
Lemolo Res.
Diamond Lake
ROSEBURG
Dixonville
Green
Winston
Dillard
Myrtle Creek
Tri City
Days Creek
Riddle
Canyonville
Tiller
Azalea
Glendale
Myrtle Point
Camas Valley
Coquille
North Bend
COOS BAY
CRATER LAKE
Crater Lake
NATIONAL PARK

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Umpqua River Basin	)))))	Umpqua Basin May 8, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has undertaken a study of the Umpqua River Basin;

WHEREAS results of that study have been published in the State Water Resources Board report, Umpqua River Basin dated July 1958;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 first adopted a program dated October 24, 1958; to classify the water resources of the Umpqua River Basin;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 and ORS 536.340 has undertaken a restudy of the Umpqua River Basin as delineated on State Water Resources Board Map 16.6, dated 1969;

WHEREAS the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Umpqua River Basin;

WHEREAS in all studies consideration was given to means and methods of augmenting, conserving, and classifying such water resources; existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses; and for pollution abatement as well as other related subjects including drainage, reclamation, flood plains and reservoir sites; and

WHEREAS as a result of said studies the following findings have been reached by this Board:

I. Basinwide Findings

A. There is sufficient water supply on an annual yield basis to satisfy existing and future needs.

B. There is a seasonal distribution problem with insufficient water supply in many streams during the low flow months.

C. Irrigation water use is the major consumptive use of the resource in the basin.

* Modifies Umpqua River Basin Programs dated October 24, 1958; October 31, 1960; April 3, 1964; and March 26, 1974.

D. In many streams shortages of surface water supply for irrigation occur during the late summer months.

E. Most municipal water use is supplied by surface water sources.

F. In many streams during the low flow season, flows are less than minimum perennial streamflows recognized as needed to sustain fish life.

G. Recommended minimum perennial streamflows for fish life during August through October in many streams can be met only through augmentation of existing or natural low flows.

H. Major water pollution problems exist in many streams in the basin. Both man-made and natural pollution exist.

I. Future water supply needs will be met primarily by surface water and will require storage of winter flows. Storage sites exist throughout the basin.

J. Known ground water supplies are of limited quantity throughout most of the basin.

K. A study of the available ground water resource and its distribution is needed.

L. Existing use of water under domestic water rights, although small relative to existing streamflow, is of great importance.

M. Future consumptive withdrawals could conflict with instream uses in many streams.

N. There are sites on some streams where substantial potential exists for hydroelectric power development.

O. Existing and potential water use for mining is small.

P. Recreation is an important factor in the economy of the basin and will increase in importancae in the future. Sport fishing is presently a leading water-based recreational activity.

Q. Existing out-of-stream recreational water use is small, relative to existing streamflows.

R. Substantial potential exists for instream recreational water use.

S. Existing consumptive wildlife water use is small.

T. Potential exists for water use to enhance waterfowl habitat.

U. The existing anadromous fish resource is of national significance.

V. The anadromous fish resource of the basin contributes to the West Coast commercial fish industry.

W. Adequate perennial streamflows are essential to the preservation of the anadromous fish resource.

X. Improvement of streamflow to enhance water quality would be beneficial, but utilization of natural streamflows to minimize man-made pollution by dilution would conflict with other beneficial uses.

Y. Localized flooding, drainage, and streambank erosion problems exist.

II. North Umpqua Subbasin Findings

A. Total quantities of water are sufficient to satisfy all existing and contemplated needs and uses of water.

B. North Umpqua River has adequate flows in the main stem and most tributaries to fulfill existing requirements and satisfy minimum recommended fish flows.

C. Sites exist for substantial hydroelectric power development on the main stem of the North Umpqua. Development of these sites lacks economic feasibility at present.

D. Fish life and wildlife uses represent and will continue to bring substantial benefits to the subbasin and the state.

E. Recreational use represents and will continue to bring substantial economic benefits to the subbasin and the state. Sport fishing is one of the largest recreational uses in the North Umpqua Subbasin.

F. Domestic and livestock uses, while small, represent a significant factor in existing and contemplated needs and uses of water.

G. Municipal requirements represent a significant factor in existing and contemplated needs and uses of water. Water is exported to serve municipalities outside the North Umpqua Subbasin.

H. Drainage and reclamation of drained lands are not present or contemplated significant factors in water use.

I. The existing anadromous fish resource is of national significance.

J. Maintenance of minimum perennial streamflows sufficient to support aquatic life is essential to anadromous fish propagation and is in the public interest.

K. Existing minimum perennial streamflow (established in 1958) consists of one point at the mouth of the North Umpqua River.

L. Irrigation is not a significant factor in existing and contemplated future needs for water.

M. Mining use represents no significant utilization of water at present or in the foreseeable future.

N. Industrial requirements above Winchester Dam will not be a significant factor in contemplated future needs of water.

O. Improvement of streamflow to enhance water quality would be beneficial, but utilization of streamflows to minimize man-made pollution by dilution would conflict with other beneficial uses.

P. It is imperative that single-purpose development of available storage sites does not preclude full utilization of the resource through multipurpose developments.

III. South Umpuqua Subbasin Findings

A. Total quantities of water on an annual basis are sufficient to satisfy all existing and contemplated needs and uses of water.

B. There is a seasonal distribution problem with insufficient water supply in many streams during the low flow months.

C. Natural flows during the summer months are inadequate to fulfill existing demands for beneficial uses in most years including the requirements for minimum perennial streamflows.

D. Domestic and livestock uses represent a significant factor in existing and contemplated needs and uses of water.

E. Recommended minimum perennial streamflows cannot be maintained if future large scale domestic withdrawals are met by direct diversion from streams during the low flow periods.

F. Municipal water demands represent a significant factor in existing and contemplated needs and uses of water.

G. There are existing municipal water rights on the South Umpqua River of substantial magnitude.

H. Average annual municipal water diversions in the South Umpqua Subbasin are about 50 percent of the total municipal water rights in the subbasin.

I. There is a substantial amount of potentially irrigable land in the South Umpqua Subbasin and about 30 percent of the acreage is covered under existing water rights.

J. About 50 percent of the irrigable land covered under existing water rights is presently being irrigated. Much of the irrigated land does not receive a full supply in many years.

K. Future irrigation water use can be provided only through stored water if minimum perennial streamflows are to be maintained.

L. There are existing industrial water rights on the South Umpqua River of substantial magnitude.

M. The existing industrial water use on the South Umpqua Subbasin amounts to about 30 percent of the subbasin's total industrial water rights.

N. Future industrial water use could require substantial quantities of water and can be provided only through stored water if minimum perennial streamflows are to be maintained.

O. Mining use represents no significant utilization of water at present or in the foreseeable future.

P. Recreation is an important factor in the economy of the basin and will increase in importance in the future. Sport fishing is presently the leading water-based recreational activity.

Q. Existing out-of-stream recreational water use is small, relative to existing streamflows.

R. Substantial potential exists for recreational use, mostly for instream use if adequate flows can be provided. In most streams adequate summer flows can be provided only by storage of winter flows.

S. Existing wildlife water use is small.

T. The existing anadromous fish resource is significant as a part of the West Coast commercial fishery.

U. Adequate perennial streamflows are essential to the preservation of the anadromous fish resource. In most streams storage of winter flows will be necessary to provide adequate perennial streamflows.

V. Existing minimum perennial streamflows (established in 1958) consist of two points -- one at the mouth of Cow Creek and the other at the mouth of the South Umpqua River.

W. Augmentation of streamflow to enhance water quality would be beneficial, but utilization of natural streamflows to minimize man-made pollution by dilution would conflict with other beneficial uses.

X. There are potential storage sites existing in the subbasin. Studies have shown many of these sites are physically feasible for development.

Y. There is little potential for hydroelectric power development in the subbasin.

Z. It is imperative that single-purpose development of available sites does not preclude full utilization of the resource through multi-purpose programs.

AA. Drainage and reclamation of drained lands are not present or contemplated significant factors in water use.

BB. Flood control problems in this subbasin are of significant magnitude.

CC. Known ground water supplies are of limited quantity throughout most of the subbasin.

DD. Future consumptive withdrawals can be supplied only from stored water during the low flow period if minimum perennial streamflows are to be maintained.

EE. Full utilization of the water resource potential in the South Umpqua Subbasin will be obtained only through storage of surplus winter flows.

IV. Calapooya and Elk Subbasins Findings

A. Total quantities of water on an annual basis are sufficient to satisfy all existing and contemplated needs and uses of water.

B. There is a seasonal distribution problem with insufficient water supply in all streams during the low flow period.

C. Natural flows during the summer months are inadequate to fulfill existing demands for beneficial uses in most years. Recorded measurements and/or observations in the lower reaches of both Calapooya and Elk Creeks show periods of no streamflow in many years.

D. Domestic and livestock uses, while small, represent a significant factor in existing and contemplated needs and uses of water.

E. Existing municipal and industrial water use is less than 15 percent of the total use in the subbasins.

F. Insufficient streamflow exists during low flow months to meet identified future municipal and industrial water demands by direct diversion.

G. There is a substantial amount of potentially irrigable land in the subbasins.

H. About 20 percent of the total potentially irrigable land is covered under existing water rights in Calapooya Creek and 40 percent in Elk Creek.

I. About 60 percent of the land covered under existing water rights is presently being irrigated in the Calapooya Subbasin and 80 percent in the Elk Subbasin. Water is not available for a full supply to most of the irrigated acreage in many years.

J. Insufficient streamflow exists during the low flow months to provide a full supply to any additional acreage.

K. Mining use represents no significant utilization of water at present or in the foreseeable future.

L. Recreation is an important factor in the economy of the subbasins and will increase in importance in the future. Sport fishing is presently the leading water-based recreational activity.

M. Existing out-of-stream recreational water use is small, relative to existing streamflows.

N. Existing wildlife water use is small.

O. The existing anadromous fish resource is significant as a part of the West Coast commercial fishery.

P. Adequate perennial streamflows are essential to the preservation of the anadromous fish resource. In many streams storage of winter flows will be necessary to provide adequate perennial streamflows during low flow months.

Q. Existing minimum perennial streamflow (established in 1958) consists of one point at the mouth of Calapooya Creek.

R. Augmentation of streamflow to enhance water quality would be beneficial, but utilization of natural streamflows to minimize man-made pollution by dilution would conflict with other beneficial uses.

S. There are potential storage sites existing in subbasins. Studies have shown many of these sites are physically feasible for development.

T. There is little potential for hydroelectric power development in the subbasins.

U. It is imperative that single-purpose development of available sites does not preclude full utilization of the resource.

V. Reclamation of drained lands is not a present or contemplated significant factor in water use.

W. Flood control problems in these subbasins are largely local in nature.

X Known ground water supplies are of limited quantity throughout most of the subbasins.

Y. Future consumptive withdrawals can be supplied only from stored water if minimum perennial streamflows are to be maintained.

Z. Full utilization of the water resource potential in the Calapooya and Elk Subbasins will be obtained only through storage of surplus winter flows.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Umpqua River Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Umpqua River Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the

aforementioned waters only for domestic, livestock, municipal, irrigation, temperature control, power development, industrial, mining, recreation, wildlife and fish life uses; and the waters of the Umpqua River Basin are hereby so classified with the following exceptions:

1. Preference shall be given to human consumption and livestock consumption purposes for all the waters of the Umpqua River Basin over any other beneficial uses.

2. The waters of the natural lakes of the Umpqua River Basin are classified only for the utilization of water for domestic, livestock, power development not to exceed 7 1/2 theoretical horsepower, and in-lake uses for recreation, wildlife, and fish life purposes.

3. The waters of Roberts Creek and its tributares are withdrawn by State Water Resources Board's Order of Withdrawal, dated May 22, 1959.

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for human consumption and livestock consumption uses and waters legally released from storage shall be made or granted by any state agency or public corporation of the state for the waters of the following streams as specified:

Minimum Perennial Streamflows (cfs)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept

North Umpqua River

North Umpqua River -- to be maintained in the North Umpqua River at or near the headwaters of Toketee Lake (SE 1/4 Section 25, Township 26 South, Range 3 East)

200	200	200	200	200	200	200	200	150	150	100	100	100

Clearwater River -- to be maintained in the Clearwater River at or near its confluence with the North Umpqua River (SW 1/4 Section 36, Township 26 South, Range 3 East)

50	50	50	50	50	50	50	50	40	40	30	30	30

Fish Creek -- to be maintained in Fish Creek at or near its confluence with the North Umpqua River (NW 1/4 Section 28, Township 26 South, Range 3 East)

20	40	60	60	60	60	60	60	40	20	15	15	15

Boulder Creek -- to be maintained in Boulder Creek at or near its confluence with the North Umpqua River (SW 1/4 Section 13, Township 26 South, Range 2 East)

12	25	35	35	35	35	35	35	25	12	6	6	6

North Umpqua River -- to be maintained from its confluence with Boulder Creek (SW 1/4 Section 13, Township 26 South, Range 2 East) to its confluence with Steamboat Creek (SW 1/4 Section 32, Township 25 1/2 South, Range 1 East)

400	400	400	400	400	400	400	400	400	300	300	300	400

Copeland Creek -- to be maintained in Copeland Creek at or near its confluence with the North Umpqua River (SE 1/4 Section 23, Township 26 South , Range 2 East)

15	25	40	40	40	40	40	40	25	15	7	7	7

Calf Creek -- to be maintained in Calf Creek at or near its confluence with the North Umpqua River (SE 1/4 Section 19, Township 26 South, Range 2 East)

12	20	35	35	35	35	35	35	20	12	4	4	4

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Limpy Creek -- to be maintained in Limpy Creek at or near its confluence with the North Umpqua River (SE 1/4 Section 15, Township 26 South, Range 1 East)												
12	20	20	20	20	20	20	20	12	8	5	5	5
Steamboat Creek -- to be maintained from its confluence with Steelhead Creek (NW 1/4 Section 26, Township 25 South, Range 1 East) to its confluence with Canton Creek (NW 1/4 Section 32, Township 25 1/2 South, Range 1 East)												
40	60	90	90	130	130	130	130	100	60	40	40	30
Steelhead Creek - to be maintained in Steelhead Creek at or near its confluence with Streamboat Creek (NW 1/4 Sec. 26, Township 25 South, Range 1 East)												
8	8	15	15	25	25	25	25	15	8	3	3	3
Canton Creek - to be maintained from its confluence with Scaredman Creek (NE 1/4, Sec. 23, Township 25 South, Range 1 West) to its confluence with Steamboat Creek (NW1/4 Sec. 32, Township 25 1/2 South, Range 1 East)												
20	30	50	50	90	90	90	90	50	30	15	15	10
Steamboat Creek - to be maintained in Steamboat Creek at or near its confluence with the North Umpqua River (SW 1/4 Sec. 32, Township 25 1/2 South, Range 1 East)												
50	150	180	180	180	180	180	180	150	75	50	50	40
North Umpqua River -- to be maintained from its confluence with Steamboat Creek (SW 1/4 Section 32, Township 25 1/2 South, Range 1 East) to its confluence with the Little River (NW 1/4 Section 19, Township 26 South, Range 3 West)												
600	600	600	600	600	600	600	600	600	400	400	400	600
Rock Creek -- to be maintained from its confluence with Kelly Creek (NW 1/4 Section 31, Township 25 South, Range 2 West) to its confluence with the North Umpqua River (SW 1/4 Section 1, Township 26 South, Range 3 West)												
25	50	90	80	80	80	80	80	60	40	30	25	20

(10)

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	July	Aug	Sept	
Little River -- to be maintained from its confluence with Emile Creek (SE 1/4 Section 2, Township 27 South, Range 2 West) to its confluence with Cavitt Creek (NE 1/4 Section 11, Township 27 South, Range 3 West)												
20	50	80	80	80	80	80	80	60	40	15	15	15
Little River -- to be maintained from its confluence with with Cavitt Creek (NE 1/4 Section 11, Township 27 South, Range 3 West) to its confluence with the North Umpqua River (NW 1/4 Section 19, Township 26 South, Range 3 West)												
30	70	150	150	150	150	150	150	100	60	40	20	20
Cavitt Creek -- to be maintained in Cavitt Creek at or near its confluence with the Little River (NE 1/4 Section 11, Township 27 South, Range 3 West)												
10	25	45	45	45	45	45	45	30	15	8	5	5
* North Umpqua River -- to be maintained from its confluence with with the Little River (NW 1/4 Section 19, Township 26 South, Range 3 West) to its confluence with the Umpqua River (NW 1/4 Section 32, Township 26 South, Range 6 West)												
800	800	800	800	800	800	800	800	800	600	600	600	750
Umpqua River												
* Umpqua River -- to be maintained from its confluence with the North Umpqua River (NW 1/4 Section 32, Township 26 South, Range 6 West) to its mouth (SW 1/4 Section 12, Township 22 West, Range 13 West)												
900	1000	1000	1000	1000	1000	1000	1000	1000	1000	750	750	750
Hubbard Creek -- to be maintained in Hubbard Creek at or near its confluence with the Umpqua River (NW 1/4 Section 21, Township 25 South, Range 7 West)												
8	15	25	25	25	25	25	25	15	8	4	4	4

* Modifies minimum perennial streamflows established on October 24, 1958.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Wolf Creek -- to be maintained in Wolf Creek at or near its confluence with the Umpqua River (NE 1/4 Section 31, Township 24 South, Range 7 West)												
10	30	45	45	45	45	45	45	30	15	4	4	4
Yellow Creek -- to be maintained in Yellow Creek at or near its confluence with the Umpqua River (SW 1/4 Section 12, Township 24 South, Range 7 West)												
5	10	15	15	15	15	15	15	10	5	2	1	1
Mehl Creek -- to be maintained in Mehl Creek at or near its confluence with the Umpqua River (SE 1/4 Section 12, Township 23 South, Range 8 West)												
5	10	15	15	15	15	15	15	10	5	1	1	1
Paradise Creek -- to be maintained in Paradise Creek at or near its confluence with the Umpqua River (NE 1/4 Section 9, Township 22 South, Range 8 West)												
10	30	40	40	30	30	30	30	20	12	5	3	3
Weatherly Creek -- to be maintained in Weatherly Creek at or near its confluence with the Umpqua River (SW 1/4 Section 14, Township 22 South, Range 9 West)												
5	10	20	20	20	20	20	20	15	8	4	2	2
Mill Creek -- to be maintained from its confluence with Camp Creek (SW 1/4 Section 36, Township 22 South, Range 10 West) to its confluence with the Umpqua River (SE 1/4 Section 15, Township 22 South, Range 10 West)												
40	70	130	100	100	100	100	100	70	40	20	20	20
Camp Creek -- to be maintained in Camp Creek at or near its confluence with Mill Creek (SW 1/4 Section 36, Township 22 South, Range 10 West)												
10	20	45	35	35	35	35	35	20	15	8	5	5

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Dean Creek -- to be maintained from its confluence with Hakki Creek (NW 1/4 Section 3, Township 22 South, Range 11 West) to its confluence with the Umpqua River (SE 1/4 Section 34, Township 21 South, Range 11 West)												
5	12	20	20	20	20	20	20	12	5	2	2	2
Schofield Creek -- to be maintained from its confluence with Oar Creek (SW 1/4 Section 1, Township 22 South, Range 12 West) to its confluence with the Umpqua River (NE 1/4 Section 34, Township 21 South, Range 12 West)												
5	12	20	20	20	20	20	20	12	5	2	2	2
Smith River												
Smith River -- to be maintained from its confluence with Halfway Creek (SW 1/4 Section 1, Township 21 South, Range 8 West) to its confluence with the West Fork Smith River (NW 1/4 Section 27, Township 20 South, Range 9 West)												
10	20	90	90	90	90	90	90	60	40	20	15	10
Halfway Creek -- to be maintained in Halfway Creek at or near its confluence with the Smith River (SW 1/4 Section 1, Township 21 South, Range 8 West)												
3	10	20	20	20	20	20	20	10	3	3	1	1
Big Creek -- to be maintained in Big Creek at or near its confluence with the Smith River (SW 1/4 Section 4, Township 21 South, Range 8 West)												
3	10	20	20	20	20	20	20	10	3	3	1	1
Sister Creek -- to be maintained in Sister Creek at or near its confluence with the Smith River (NE 1/4 Section 18, Township 20 South, Range 8 West)												
5	20	40	40	40	40	40	40	25	10	5	5	5
West Fork Smith River -- to be maintained in the West Fork Smith River at or near its confluence with the Smith River (NW 1/4 Section 27, Township 20 South, Range 9 West)												
5	15	40	50	40	40	40	40	30	15	5	5	5

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
* Smith River -- to be maintained from its confluence with the West Fork Smith River (NW 1/4 Section 27, Township 20 South, Range 9 West) to its confluence with the North Fork Smith River (NE 1/4 Section 6, Township 21 South, Range 10 West)												
15	30	150	150	150	150	150	150	100	80	30	20	15
Vincent Creek -- to be maintained in Vincent Creek at or near its confluence with the Smith River (NE 1/4 Section 33, Township 20 South, Range 9 West)												
3	10	30	30	30	30	30	20	10	3	2	1	1
Johnson Creek -- to be maintained in Johnson Creek at or near its confluence with the Smith River (NW 1/4 Section 29, Township 20 South, Range 10 West)												
2	10	20	20	20	20	20	20	10	5	2	1	1
Spencer Creek -- to be maintained in Spencer Creek at or near its confluence with the Smith River (NW 1/4 Section 34, Township 20 South, Range 10 West)												
2	10	35	20	20	20	20	20	10	5	2	1	1
* North Fork Smith River -- to be maintained in the North Fork Smith River at or near its confluence with the Smith River (NE 1/4 Section 6, Township 21 South, Range 10 West)												
10	30	90	70	70	70	70	70	50	30	15	10	10
* Smith River -- to be maintained from its confluence with the North Fork Smith River (NE 1/4 Section 36, Township 21 South, Range 10 West) to its confluence with the Umpqua River (NE 1/4 Section 35, Township 21 South, Range 12 West)												
30	100	180	180	180	180	180	180	150	100	50	30	30

* Modifies minimum perennial streamflows established on October 24, 1958.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept

Elk Creek

Elk Creek -- to be maintained from its confluence with Curtis Creek (NW 1/4 Section 30, Township 22 South, Range 4 West) to its confluence with Pass Creek (NE 1/4 Section 17, Township 22 South, Range 5 West)

10	30	70	70	70	70	70	70	50	25	7	5	5

Yoncalla Creek -- to be maintained in Yoncalla Creek at or near its confluence with Elk Creek (SE 1/4 Section 21, Township 22 South, Range 5 West)

2	10	15	15	15	15	15	15	10	4	2	1	1

Pass Creek -- to be maintained from its confluence with Sand Creek (SW 1/4 Section 34, Township 21 South, Range 5 West) to its confluence with Elk Creek (NE 1/4 Section 17, Township 22 South, Range 5 West)

10	25	40	40	40	40	40	40	25	10	5	5	5

Elk Creek -- to be maintained from its confluence with Pass Creek (NE 1/4 Section 17, Township 22 South, Range 5 West) to its confluence with Brush Creek (NE 1/4 Section 14, Township 22 South, Range 7 West)

15	70	110	110	110	110	110	110	70	30	15	10	10

Billy Creek -- to be maintained in Bill Creek at or near its confluence with Elk Creek (NW 1/4 Section 18, Township 22 South, Range 5 West)

3	15	25	25	25	25	25	25	15	5	3	3	3

Hardscrabble Creek -- to be maintained in Hardscrabble Creek at or near its confluence with Elk Creek (SE 1/4 Section 11, Township 22 South, Range 6 West)

3	10	15	15	15	15	15	15	5	3	1	1	1

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Jack Creek -- to be maintained in Jack Creek at or near its confluence with Elk Creek (NE 1/4 Section 15, Township 22 South, Range 6 West)												
3	7	10	10	10	10	10	10	5	3	1	1	1
Brush Creek -- to be maintained in Brush Creek at or near its confluence with Elk Creek (NE 1/4 Section 14, Township 22 South, Range 7 West)												
5	15	30	30	30	30	30	30	15	10	3	3	3
Elk Creek -- to be maintained from its confluence with Brush Creek (NE 1/4 Section 14, Township 22 South, Range 7 West) to its confluence with th Umpqua River (NE 1/4 Section 30, Township 22 South, Range 7 West)												
10	50	110	110	110	110	110	110	80	50	15	10	10
Big Tom Folley Creek -- to be maintained in Big Tom Folley Creek at or near its confluence with Elk Creek (NE 1/4 Section 10, Township 22 South, Range 7 West)												
5	15	30	30	30	30	30	30	20	10	3	3	3
Calapooya Creek												
Gassy Creek -- to be maintained in Gassy Creek at or near its confluence with Calapooya Creek Creek (SE 1/4 Section 2, Township 25 South, Range 4 West)												
5	10	20	20	20	20	20	20	15	5	2	2	2
Calapooya Creek -- to be maintained from its confluence with Gassy Creek (SE 1/4 Section 2, Township 25 South, Range 4 West) to its confluence with Williams Creek (NE 1/4 Section 12, Township 25 South, Range 6 West)												
10	30	70	70	70	70	70	70	50	25	10	10	10

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Oldham Creek -- to be maintained in Oldham Creek at or near its confluence with Calapooya Creek (SE 1/4 Section 26, Township 24 South, Range 5 West)												
5	5	10	15	20	20	20	20	10	6	3	3	3
Cabin Creek -- to be maintained in Cabin Creek at or near its confluence with Calapooya Creek (NW 1/4 Section 4, Township 25 South, Range 5 West)												
5	5	10	10	10	10	10	10	6	4	1	1	1
Williams Creek -- to be maintained in Williams Creek at or near its confluence with Calapooya Creek (NE 1/4 Section 12, Township 25 South, Range 6 West)												
3	10	25	25	25	25	25	25	10	5	1	1	1
* **Calapooya Creek** -- to be maintained from its confluence with Williams Creek (NE 1/4 Section 12, Township 25 South, Range 6 West) to its confluence with the Umpqua River (SE 1/4 Section 25, Township 25 South, Range 7 West)												
20	50	100	100	100	100	100	100	70	40	12	12	12
South Umpqua River												
Buckeye Creek -- to be maintained in Buckeye Creek at or near its confluence with the South Umpqua River (NE 1/4 Section 16, Township 29 South, Range 1 East)												
8	8	15	15	25	25	25	25	15	8	3	3	3
Boulder Creek -- to be maintained in Boulder Creek at or near its confluence with the South Umpqua River (SW 1/4 Section 13, Township 29 South, Range 1 West)												
10	20	35	35	35	35	35	35	20	12	5	5	5

* Modifies minimum perennial streamflows established on October 24, 1958.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
South Umpqua River -- to be maintained from its confluence with Boulder Creek (SE 1/4 Section 13, Township 29 South, Range 1 West) to its confluence with Elk Creek (NE 1/4 Section 33, Township 30 South, Range 2 West)												
50	100	180	180	180	180	180	180	150	100	80	50	50
Deadman Creek -- to be maintained in Deadman Creek at or near its confluence with the South Umpqua River (NW 1/4 Section 18, Township 30 South, Range 1 West)												
10	15	30	30	30	30	30	30	20	12	5	5	5
Jackson Creek -- to be maintained in Jackson Creek at or near its confluence with the South Umpqua River (NW 1/4 Section 18, Township 30 South, Range 1 West)												
25	50	100	100	100	100	100	100	70	40	25	25	25
Elk Creek -- to be maintained from its confluence with Drew Creek (SW 1/4 Section 11, Township 31 South, Range 2 West) to its confluence with the South Umpqua River (NE 1/4 Section 33, Township 30 South, Range 2 West)												
5	25	55	55	55	55	55	55	25	15	5	3	3
South Umpqua River -- to be maintained from its confluence with Elk Creek (NE 1/4 Section 33, Township 30 South, Range 2 West) to its confluence with Cow Creek (SW 1/4 Section 19, Township 30 South, Range 5 West)												
80	180	300	250	250	250	250	250	180	140	90	60	60
Coffee Creek -- to be maintained in Coffee Creek at or near its confluence with the South Umpqua River (NW 1/4 Section 30, Township 30 South, Range 2 West)												
4	10	20	20	20	20	20	20	15	8	4	2	2

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Days Creek -- to be maintained in Days Creek at or near its confluence with the South Umpqua River (SE 1/4 Section 9, Township 30 South, Range 4 West)												
5	15	30	30	30	30	30	30	20	8	4	2	2
O'Shea Creek -- to be maintained in O'Shea Creek at or near its confluence with the South Umpqua River (NE 1/4 Section 27, Township 30 South, Range 5 West)												
3	10	15	15	15	15	15	15	10	5	1	1	1
Canyon Creek -- to be maintained in Canyon Creek at or near its confluence with the South Umpqua River (SW 1/4 Section 22, Township 30 South, Range 5 West)												
5	15	30	30	30	30	30	30	15	5	2	2	2
Cow Creek -- to be maintained from USGS - State Engineer Gage 14-3090 at stream mile 58.2 (NE 1/4 Section 4, Township 32 South, Range 4 West) to its confluence with Windy Creek (SW 1/4 Section 33, Township 32 South, Range 6 West)												
10	30	60	60	60	60	60	60	40	20	10	10	10
Whitehorse Creek -- to be maintained in Whitehorse Creek at or near its confluence with Cow Creek (SW 1/4 Section 4, Township 32 South, Range 4 West)												
1	5	15	20	20	20	20	15	10	5	1	1	1
Starveout Creek -- to be maintained in Starveout Creek at or near its confluence with Cow Creek (SE 1/4 Section 12, Township 32 South, Range 5 West)												
1	5	15	15	15	15	15	10	8	5	1	1	1
Quines Creek -- to be maintained in Quines Creek at or near its confluence with Cow Creek (NE 1/4 Section 22, Township 32 South, Range 5 West)												
5	15	25	25	25	25	25	20	15	5	3	3	3

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Windy Creek -- to be maintained in Windy Creek at or near its confluence with Cow Creek (SW 1/4 Section 33, Township 32 South, Range 6 West)												
5	15	25	25	25	25	25	25	15	10	3	3	3
Cow Creek -- to be maintained from its confluence with Windy Creek (SW 1/4 Section 33, Township 32 South, Range 6 West) to its confluence with Middle Creek (SW 1/4 Section 1, Township 32 South, Range 8 West)												
30	50	70	70	70	70	70	70	50	35	20	20	20
Riffle Creek -- to be maintained in Riffle Creek at or near its confluence with Cow Creek (SW 1/4 Section 18, Township 32 South, Range 7 West)												
3	10	20	20	20	20	20	15	10	5	1	1	1
Middle Creek -- to be maintained in Middle Creek at or near its confluence with Cow Creek (SW 1/4 Section 1, Township 32 South, Range 8 West)												
5	15	45	45	45	45	45	45	30	15	5	5	5
West Fork Cow Creek -- to be maintained in West Fork Cow Creek at or near its confluence with Cow Creek (SW 1/4 Section 1, Township 32 South, Range 8 West)												
5	20	60	60	60	60	60	60	40	20	10	5	5
*** Cow Creek -- to be maintained from its confluence with Middle Creek (SW 1/4 Section 1, Township 32 South, Range 8 West) to its confluence with the South Umpqua River (SW 1/4 Section 19, Township 30 South, Range 5 West)**												
30	80	150	150	135	135	135	135	100	70	50	20	20

* Modifies minimum perennial streamflows established on October 24, 1958.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
South Umpqua River -- to be maintained from its confluence with Cow Creek (SW 1/4 Section 19, Township 30 South, Range 5 West) to the USGS Gage 14-3120 at stream mile 21.1 (NW 1/4 Section 15, Township 28 South, Range 6 West)												
90	250	400	350	350	350	350	350	275	225	120	70	70
North Fork Myrtle Creek -- to be maintained in the North Fork Myrtle Creek at or near its confluence with the South Fork Myrtle Creek (NW 1/4 Section 27, Township 29 South, Range 5 West)												
6	20	35	35	35	35	35	35	20	10	6	3	3
South Fork Myrtle Creek - to be maintained in the South Fork Myrtle Creek at or near its confluence with the North Fork Myrtle Creek (NW 1/4 Sec. 27, Township 29 South, Range 5 West)												
5	20	35	35	35	35	35	35	20	10	5	2	2
Myrtle Creek -- to be maintained in Myrtle Creek at or near its confluence with the South Umpqua River (NW 1/4 Section 28, Township 29 South, Range 5 West)												
10	30	50	50	50	50	50	50	35	20	10	5	5
Willis Creek -- to be maintaned in Willis Creek at or near its confluence with the South Umpqua River (NW 1/4 Section 3, Township 29 South, Range 6 West)												
2	10	15	15	15	15	15	15	10	5	2	2	2
Rice Creek -- to be maintained in Rice Creek at or near its confluence with the South Umpqua River (NW 1/4 Section 4, Township 29 South, Range 6 West)												
2	10	15	15	15	15	15	15	10	5	2	2	2
Kent Creek -- to be maintained in Kent Creek at or near its confluence with the South Umpqua River (SW 1/4 Section 29, Township 28 South, Range 6 West)												
2	10	15	15	15	15	15	15	10	4	1	1	1

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
		Olalla Creek -- to be maintained from its confluence with Berry Creek (SE 1/4 Section 20, Township 29 South, Range 7 West) to its confluence with Tenmile Creek (SW 1/4 Section 27, Township 28 South, Range 7 West)										
5	20	45	45	45	45	45	45	25	15	5	3	3
		Tenmile Creek -- to be maintained in Tenmile Creek at or near its confluence with Olalla Creek (SW 1/4 Section 27, Township 28 South, Range 7 West)										
5	15	30	40	40	40	40	30	20	10	3	2	2
		Olalla Creek -- to be maintained from its confluence with Tenmile Creek (SW 1/4 Section 27, Township 28 South, Range 7 West) to its confluence with Lookingglass Creek (NE 1/4 Section 2, Township 28 South, Range 7 West)										
5	30	75	75	75	75	75	60	30	20	5	5	5
		Lookingglass Creek -- to be maintained in Lookingglass Creek at or near its confluence with Olalla Creek (NE 1/4 Section 2, Township 28 South, Range 7 West)										
3	5	20	25	25	25	25	20	10	5	3	1	1
		Lookingglass Creek -- to be maintained from its confluencae with Olalla Creek (NE 1/4 Section 2, Township 28 South, Range 7 West) to its confluence with the South Umpqua River (SE 1/4 Section 20, Township 28 South, Range 6 West)										
10	40	90	90	90	90	90	60	30	15	10	5	5
		* South Umpqua River -- to be maintained from the USGS Gage 14-3120 at stream mile 21.1 (NW 1/4 Section 15, Township 28 South, Range 6 West) to its confluence with the Umpqua River (NE 1/4 Section 31, Township 26 South, Range 6 West)										
90	300	400	350	350	350	350	350	275	225	150	90	90

* Modifies minimum perennial streamflows established on October 24, 1958.

Minimum Perennial Streamflows (cfs)
(continued)

Oct		Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
1-15	16-31											
Deer Creek -- to be maintained in Deer Creek at or near its confluence with the South Umpqua River (SW 1/4 Section 18, Township 27 South, Range 5 West)												
4	10	30	30	30	30	30	30	15	10	4	4	4

C. All applications for appropriation of water for storage in structures impounding more than 3,000,000 gallons of water shall be reviewed by the Water Policy Review Board prior to approval. During the review the Water Policy Review Board may establish additional minimum flows on the natural flow of the stream to support aquatic life or minimize pollution.

D. To support present and proposed Umpqua River Basin water resource development, no out-of basin appropriation of the waters f the Umpqua River Basin shall be made or granted by any state agency or public corporation of the state without the prior approval of, and following a public hearing by, the Water Policy Review Board.

E. Applications for the use of the waters of the Umpqua River Basin shall not be accepted by any state agency for any purposes contrary to the classifications herein specified, and the granting of applications for such other purposes is declared to be prejudicial to the public interest, and the granting of applications for such other use would be contrary to this water use program.

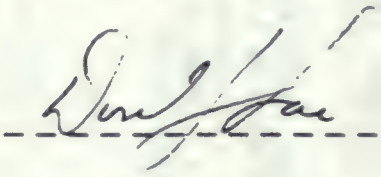
F. Rights to use of water granted by any state agency in accordancae with this water use program shall be issued only on the condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

G. Structures or works for utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed and operated in conformity with the applicable provisions of ORS 536.310; and any such structures or works, which do not give cognizance to the multiple-purpose concept, are further declared to be prejudicial to the public interest.

H. The minimum perennial streamflows established by the October 24, 1958 Umpqua basin program shall remain in effect over appropriations issued from October 24, 1958 to March 26, 1974.

Done and dated this 8th day of May, 1981.

WATER POLICY REVIEW BOARD

By 

Donel J. Lane, Chairman

5031A

SOUTH COAST BASIN

COOS
DOUGLAS
CURRY
JOSEPHINE
COOS BAY
ROSEBURG
Coquille
Bandon
Myrtle Point
Broadbent
Powers
Gold Beach
Wedderburn
Port Orford
Brookings
Harbor
Pistol River
Carpenterville
OREGON
CALIFORNIA
1977
WATER RESOURCES DEPARTMENT
SOUTH COAST BASIN
MAP NO. 17.2

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the State of Oregon	)))))	South Coast Basin May 8, 1981*

Under ORS 536.300 the Water Policy Review Board is directed to study and formulate programs for the use and control of the water resources of this state. A water resource program for the South Coast Basin as delineated on the Water Resources Department Map, File 17.6, was adopted on May 22, 1964, and modified on May 20, 1977, January 19, 1979 and April 1, 1980.

As provided by Chapter 536, Oregon Revised Statutes, the Water Policy Review Board has restudied the water resources of the South Coast Basin and has reached the following findings and conclusions:

1. Less than one percent of the average annual streamflow is estimated to occur during the months of August and September. The seasonal distribution of the resource is and will continue to be the major water supply problem in the basin.

2. There are potential water storage sites in the basin that could be developed to augment water supplies.

3. Ground water quality in the South Coast Basin is generally good, but is characterized by high iron and manganese concentrations and moderate hardness.

4. Bacterial and viral contamination caused by improper sub-surface sewage disposal and poor well construction practices exists, but is not widespread.

5. Ground water is a significant factor in the maintenance of natural lakes in the dunes area. Extensive ground water development may affect lake water levels.

6. On an annual basis, there is enough surface water for all present and future municipal needs in the basin.

7. Seasonal municipal water supply shortages will be a significant future problem in the South Coast Basin.

8. Development of municipal water supplies in storage reservoirs could meet existing and projected municipal needs.

* Modifies South Coast Basin Programs dated May 22, 1964, May 20, 1977, January 12, 1979 and April 1, 1980.

9. Ground water could be used to supplement some municipal water supplies.

10. Ground water resources in the marine terrace deposits east, north and northwest of the City of Port Orford may be sufficient to augment existing municipal supplies.

11. Aquifers in the marine terrace deposit on both sides of the Coquille River may be capable of producing ground water for the City of Bandon. The dune complex extending from Bullards Beach State Park northward appears to offer the greatest potential for municipal supplies.

12. Ground water resources in the North Bend / Coos Bay area appear to be largely limited to the dune complex and are currently being developed as a municipal water source. The potential for further development of this source is presently being studied.

13. Ground water resources in aquifers near Langlois, Coquille, Myrtle Point and Lakeside may be sufficient to augment existing supplies for those communities.

14. Selected natural lakes could be used to supplement existing municipal water supplies. Restrictions on the amount of water withdrawn may be desirable to preserve the esthetic quality of the lakes. Outlet control structures may be necessary to protect lake levels.

15. The waters of Clear Lake, Edna Lake, Ferry Creek and Geiger Creek were withdrawn for municipal use under Orders of the State Engineer.

16. Livestock, dairying, cranberries and flower bulbs are major agricultural endeavors.

17. Irrigation water shortages occur during the summer months annually on many streams throughout the South Coast Basin. Lack of surface water may deter further agricultural development in the South Coast Basin unless adequate reservoir storage is developed.

18. The existing irrigated acreage is small compared to the potentially irrigable acreage in the South Coast Basin.

19. The total extent of the ground water supply in the basin has not been determined. Existing data suggest ground water supplies are limited and would not support irrigation in most areas.

20. Marine terrace deposits and sediments of the Coquille formation are potential ground water sources for irrigation of cranberries in the Bandon area.

21. Marine terrace deposits in the Harbor area are capable of producing large quantities of water, but some areas are approaching levels of sustained yield.

22. Expansion of irrigated agriculture in the Basin will depend on development of adequate water supplies and market conditions.

23. Salt water intrusion from the Pacific Ocean forces curtailment of irrigation in the lower Coquille and Coos River valleys during periods of low flow.

24. Camas Valley, near the upper Middle Fork Coquille River, annually experiences a summer shortage of domestic and agricultural water. There is not sufficient natural flow during summer in the Middle Fork Coquille River to alleviate the summer water shortage in Camas Valley. Total annual flow is sufficient to relieve shortages if storage facilities were available to retain excess winter flows.

25. Water for temperature control for agricultural purposes is presently a significant use only in the cranberry-growing areas near Bandon, but is increasing in the Harbor Beach area.

26. Water is also used for agricultural harvesting and land preparation in the Basin.

27. Forest products and food processing are the major water-using industries in the Basin.

28. Most industry is concentrated in the Coos Bay / North Bend area and is supplied by the municipal system.

29. Some industrial users have been affected by seasonal water supply shortages. Lack of surface water may deter industrial development in the South Coast Basin, unless adequate reservoir storage is developed.

30. Seafood processing plants are the largest industrial water users in many basin communities.

31. No large mines are known to be currently active, although known coal deposits exist in the Coos Bay area and at Eden Ridge.

32. There is little information on future water needs for mining.

33. Domestic water supplies for residences outside of municipal or group domestic service areas are from wells, springs and streams. In many cases, these sources are inadequate and subject to pollution.

34. Regional water systems could improve the quality and quantity of domestic water supplies in some aras.

35. Although shortages may occur at specific locations, there is generally water of sufficient quantity and quality in the South Coast Basin for both existing and projected livestock use.

36. There are no major hydroelectric installations in the Basin.

37. The greatest potential for hydroelectric development in the Basin is on the upper South Fork Coquille River.

38. Hydroelectric generation may also be feasible on other streams in the basin.

39. Income from water-related recreation is a major contributor to the economy of the South Coast Basin.

40. The natural lakes, storage reservoirs and free-flowing streams support part of the water-based recreational use.

41. Most of the dunes area north of Coos Bay has been designated as a national recreation area.

42. The water resources, wetlands and associated habitat are critical to the subsistence and propagation of wildlife in the Basin.

43. The coastal streams support resident and anadromous species of fish.

44. The fish resources of the South Coast Basin are significant to the State of Oregon.

45. Adequate streamflow throughout the year is necessary for the maintenance of aquatic life in the coastal streams.

46. Low summer streamflow in many Basin streams is one factor limiting production of salmonids.

47. Summer flows in some streams will not support recommended minimum flows.

48. Multiple-purpose storage could be used to enhance aquatic life by augmenting streamflows and providing some water temperature control at critical times.

49. Flooding occurs frequently on many streams throughout the South Coast Basin.

50. There are presently no flood retention structures in the Basin, although localized flood protection is provided by dikes on some streams.

51. Flood plain management and watershed treatment measures may reduce flood damages in some areas.

52. South Coast river systems above the estuaries are relatively free of organic pollution although surface sources may require some treatment for human consumption.

53. Siltation and high water temperatures occur at various times of the year in a number of Basin streams, adversely affecting instream uses.

54. Drainage is a problem in many areas, primarily affecting agricultural lands.

NOW THEREFORE BE IT RESOLVED that the Water Policy Review Board hereby adopts the following revised program in accordance with the provisions of ORS 536.210 to ORS 536.590 pertaining to the water resources of the South Coast Basin as delineated on Water Resources Department Map, File 17.6;

I. Ground water resources in sections or the portions of Sections 13, 14, 22, 23, 26, 27, 32, 33 and 34 of Township 23 South, Range 13 West; 2, 3, 4, 9, 10, 11, 14, 15, 16, 17, 20, 21, 22, 27, 28, 29, 31, 32, 33 and 34 of Township 24 South, Range 13 West; and 3, 4, 5 and 6 of Township 25 South, Range 13 West, bounded on the north by Tenmile Creek, on the west by the Pacific Ocean, on the south by Coos Bay and on the east by Highway 101 are hereby classified for single or group domestic, livestock, irrigation of lawns and noncommercial gardens not exceeding one-half acre in area and any single industrial or commercial use not exceeding 5,000 gallons per day.

II. The waters of the following lakes are classified only for domestic livestock, municipal, irrigation of lawns and noncommercial gardens not exceeding one-half acre in area and in-lake use for recreation, fish life and wildlife. The Director of the Water Resources Department may place specific limits on municipal appropriations from the lakes or require outlet control structures to protect recreation, fish life and wildlife uses:

A. Bradley Lake

B. Eel Lake

C. Garrison Lake

III. All other natural lakes are classified only for domestic and livestock uses, irrigation of lawns and noncommercial gardens not exceeding one-half acre in area and in-lake use for recreation, fish life and wildlife.

IV. Waters of the following streams and all tributaries are classified only for domestic and livestock uses, irrigation of lawns and noncommercial gardens not exceeding one-half acre in area, fire control and instream use for recreation, fish life and wildlife.

A. Glenn Creek (tributary to the East Fork Millicoma River)

B. Brush Creek

V. The waters of the Middle Fork of the Coquille River and tributaries upstream from the confluence with Holmes Creek are classified only for domestic, livestock and irrigation of lawns and noncommercial gardens not exceeding one-half acre in area and instream use for recreation, fish life and wildlife during the period from July 1 to September 30 of every year. Water stored between October 1 and June 30 may be used at any time for purposes specified in paragraph VIII.

VI. The waters of the West Fork Milicoma River and tributaries above Stall Falls are classified for municipal, domestic and livestock uses, irrigation of lawns and noncommercial gardens not exceeding one-half acre in area and instream use for recreation, fish life and wildlife.

VII. The waters of Pony Creek above lower Pony Creek Dam and Ferry and Geiger Creeks above the Ferry Creek - Geiger Creek confluence are classified for municipal use.

VIII. All other surface and ground water resources are hereby classified for domestic, livestock, municipal, industrial, fire control, irrigation, agricultural use, mining, power development, recreation, wildlife and fish life uses.

IX. Water in the amounts specified is reserved in the following streams for municipal use:

A. Chetco River - three cfs, downstream from the confluence with the North Fork Chetco River

B. Winchuck River - one cfs, downstream from the confluence with Bear Creek

X. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life, no appropriations of water except for domestic or livestock uses and irrigation of noncommercial gardens not exceeding one-half acre in area shall be allowed for the waters of the streams and tributaries listed in Table 1 when flows are below the specified levels.

A. The Water Policy Review Board requests the opportunity to review applications for an allowed beneficial use that has traditionally been identified as nonconsumptive or take-and-put, such as fish hatcheries, hydroelectric facilities, municipal or water process industries that could potentially impact, in an adverse way, the Board's minimum flow regime or the public interest. The Water Policy Review Board intends to continue to protect, in its entirety, that portion of the stream system on which any minimum streamflow has been established. Permitting procedures and water use regulation should reflect that objective as far as possible under the law. The Board solicits the advice or complaints of any party who is aware that the objectives are not being met.

B. Minimum flows established in the Water Resource Program for the South Coast Basin dated May 22, 1964 (Table 2), shall remain in full force and effect except as follows:

1. The minimum perennial streamflow for the Elk River above U.S. Highway 101 crossing (45 cfs) is rescinded.

2. The minimum perennial streamflow for the Coquille River Middle Fork above Bear Creek (4 cfs) is rescinded.

3. The minimum perennial streamflow for the Sixes River above the U.S. Highway 101 crossing is reduced to 25 cfs during the period from August 1 to September 30.

4. The minimum perennial streamflow for the South Fork Coquille River near Powers is reduced to 15 cfs during the period from June 16 to September 30.

For purposes of distributing water, minimum flows established in 1964 shall be considered part of and not in addition to revised minimum flow regimes.

C. All applications for appropriation of water for storage in structures impounding more than 3,000,000 gallons of water shall be reviewed by the Water Policy Review Board prior to approval. During the review the Water Policy Review Board may establish additional minimum flows on the natural flow of the stream to support aquatic life or minimize pollution.

XI. The following reservoir sites should be protected through the comprehensive planning process for possible future development or until alternative methods of meeting water needs have been developed:

A. West Fork of the Millicoma River, site 223.

B. South Fork of Coquille River at Eden Ridge, site 430.

C. North Fork Coquille River, site 146A

D. Rock Creek at Rasler Creek, site 201.

E. Catching Creek, site 101.

F. Fourmile Creek, site 158.

G. North Fork Floras Creek at Okietown, site 435.

H. North Fork Chetco River, site 239.

I. Wheeler Creek, site 241.

J. East Fork Winchuck River, site 243.

K. Joe Ney Slough.

XII. Applications for the use of water for any purposes contrary to classifications specified in the basin program shall not be accepted or granted except as provided by law. The Director shall notify the Board and other interested individuals or agencies of the intent to accept an application for use in conflict with the adopted program in accordance with ORS 536.380 if the proposed use will not have a significant impact on any other water use as provided in Section I through XI of this program.

XIII. The planning, construction and operation of any structures or works for the utilization of water in accordance with the aforementioned classifications are to conform with the applicable provisions of ORS 536.310, including but not restricted to the recommendation of the multiple-purpose concept.

XIV. No out-of-basin diversion of South Coast Basin water shall be made or granted by any state agency or public corporation of the state without the prior approval of, and following a public hearing by, the Water Policy Review Board.

XV. Water rights and permits issued prior to the effective date of this program shall not be affected except as provided in Section X.

Done and dated this 8th day of May , 1981.

WATER POLICY REVIEW BOARD

By _____

Donel J. Lane, Chairman

TABLE 1

Minimum Perennial Streamflows (cfs)

Oct 1-15/16-31	Nov 1-15/16-30	Dec	Jan 1-15/16-31	Feb 1-15/16-28	Mar	Apr	May	June 1-15/16-30	July	Aug	Sept
Winchuck River: at USGS WRD gage 14400200 (SW 1/4 SE 1/4 Section 24, Township 41 South, Range 13 West)											
30/150	150	150	120	120	120	120	120	80/30	20	20	20
Chetco River: below North Fork Chetco River and maintained to tidewater*											
200/450	450	450	350	350	350	350	350	200/100	80	80	80
Pistol River: below Deep Creek and maintained to tidewater*											
40	40/255	255	255/230	230	230	230	230	100/30	30	20	20
Hunter Creek: below Little South Fork and maintained to tidewater*											
15/125	125	125	100	100	100	100	100	70/50	7	7	7
Euchre Creek: below Cedar Creek and maintained to tidewater*											
15/120	120	120	120/80	80	80	80	80	60/15	10	10	10
Elk River: at WRD gage 14327250 (SW 1/4 SE 1/4 Section 6, Township 33 South, Range 14 West) and maintained to tidewater*											
60/150	300	300	300	300/225	225	225	225	80/45	45	45	45
Sixes River: below Edson Creek and maintained to tidewater*											
40/215	215	215	215	215/190	190	190	190	120/40	40	25	25
Flores Creek: at Highway 101 bridge and maintained to tidewater*											
20/120	120	120	120/100	100	100	100	100	70/20	10	5	5

TABLE 1 (continued)

Minimum Perennial Streamflows (cfs)

Oct 1-15/16-31	Nov	Dec	Jan 1-15/16-31	Feb	Mar	Apr	May	June 1-15/16-30	July	Aug	Sept 1-15/16-30
North Fork Coquille River: at former USGS gage 735 (NW 1/4 Section 36, Township 28 South, Range 12 West) and maintained to the mouth											
100/80	180	180	180/160	160	160	160	160	100/50	26	26	26
Middle Creek tributary to North Fork Coquille River: below Cherry Creek and maintained to mouth											
40	70	70	70	70	70	70	55	20	10	10	10
East Fork Coquille River: above the East Fork Coquille River - China Creek confluence											
35/95	95	95	95/75	75	75	75	75	50/15	10	10	10
East Fork Coquille River: below Elk Creek and maintained to mouth											
60/110	110	110	110/95	90	90	90	90	70/25	25	15	15/20
Middle Fork Coquille River: above Twelvemile Creek											
20/50	50	50	50/35	35	35	35	35	25/8	no minimum flow		
Middle Fork Coquille River: above the Middle Fork Coquille River - Sandy Creek confluence											
40/110	110	110	110/100	100	100	100	100	70/25	10	10	10
Middle Fork Coquille River: above former USGS gage 737 (NW 1/4 SE 1/4 Section 26, Township 29 South, Range 12 West) and maintained to mouth											
50/175	175	175	175/155	155	155	155	155	100/40	15	15	15
South Fork Coquille River: at USGS - WRD Gage 14825000 (SE 1/4 Section 12, Township 31 South, Range 12 West)											
60	90	70	70	70	70	70	70	40/15	15	15	15

TABLE 1 (continued)

Minimum Perennial Streamflows (cfs)

Oct 1-15/16-31	Nov 1-15/16-30	Dec	Jan	Feb	Mar	Apr	May	June 1-15/16-30	July	Aug	Sept 1-15/16-30
South Fork Coquille River: at tidewater											
200	200	180	180	180	180	180	180	100/45	45	45	45
South Fork Coos River: at tidewater											
100/150	150	150	150	150	150	150	150	100/40	40	30	30/40
Williams River: below Bottom Creek and maintained to mouth											
80	90	90	90	90	90	90	90	60/30	30	15	15/20
Tioga Creek: below Shotgun Creek and maintained to mouth											
20/50	60	70	60	60	60	60	60	30/10	10	5	5
East Fork Millicoma River: above Matson Creek											
12	40/60	60	60	60	60	60	60	20/10	10	5	5
East Fork Millicoma River: at mouth											
50/150	150	150	130	130	130	130	130	80/20	20	15	15
West Fork Millicoma River: below Deer Creek											
15/50	60	60	60	60	60	60	60	25/10	10	5	5
West Fork Millicoma River: at mouth											
35/100	100	90	90	90	90	90	90	60/20	20	10	10
Daniels Creek: below Morgan Creek											
12	20	20	20	20	20	20	20	10	3	3	3

TABLE 1 (continued)

Minimum Perennial Streamflows (cfs)

Oct 1-15/16-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Larson Creek: at tidewater											
10/15	15	15	15	15	15	15	15	10	2	2	2
Paulouse Creek: at tidewater											
10/15	15	15	15	15	15	15	15	10	2	2	2
Roberts Creek: above confluence with Johnson Creek											
7/10	10	10	10	10	10	10	10	7	1	1	1
Benson Creek: at mouth											
8/15	15	15	15	15	15	15	15	8	2	2	2
Big Creek: above confluence with Noble Creek											
8/15	15	15	15	15	15	15	15	8	2	2	2
Eel Creek: below Eel Lake											
8/12	12	12	12	12	12	12	12	8	3	3	3

* Sand bars prevent direct surface flow to the ocean of many South Coast Basin streams at times. During such periods minimum flows shall apply to the head of the pools formed by the sand bars.

4935A

TABLE 2

MINIMUM PERENNIAL STREAMFLOWS

Adopted May 22, 1964

AS AMENDED April 1, 1980

1. Winchuck River or its tributaries above the U.S. Highway 101 crossing for flows of the Winchuck River below 20 cubic feet per second measured at a point between the U.S. Highway 101 crossing and the Winchuck River - Moser Creek confluence.

2. The Chetco River or its tributaries above the Chetco River - Chetco River North Fork confluence for flows of the Chetco River below 80 cubic feet per second measured at a point between said confluence and the Chetco River - Glen Brook confluence.

3. The Pistol River or its tributaries above the Pistol River - Cook Creek confluence for flows of the Pistol River below 15 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

4. Hunter Creek or its tributaries above U.S. Highway 101 crossing for flows of the Hunter Creek below 7 cubic feet per second measured at a point between U.S. Highway 101 crossing and 2.0 miles above said crossing.

5. Euchre Creek or its tributaries for flows of the Euchre Creek below 10 cubic feet per second measured at a point between the mouth and the Euchre Creek - Cedar Creek confluence.

6. The Sixes River or its tributaries above the U.S. Highway 101 crossing for flows of the Sixes River below 30 cubic feet per second measured at a point between U.S. Highway 101 crossing and the Sixes River - Beaver Creek confluence. (25 cubic feet per second during the period August 1 to September 30.)

7. Floras Creek or its tributaries above the U.S. Highway 101 crossing for flows of the Floras Creek below 5 cubic feet per second measured at a point between U.S. Highway 101 crossing and 0.5 miles above said crossing.

8. The Coquille River North Fork or its tributaries above former USGS Gage 735 (NW 1/4 Section 36, Township 28 South, Range 12 West), near Myrtle Point, Oregon for flows of the Coquille River North Fork below 26 cubic feet per second measured at the aforementioned gage site.

9. The Coquille River North Fork or its tributaries above the Coquille River North Fork - Whitly Creek confluence for flows of the Coquille River North Fork below 8 cubic feet per second, measured at a point between said confluence and the Coquille River North Fork - Neeley Creek confluence.

10. The Coquille River East Fork or its tributaries above the Coquille River East Fork - China Creek confluence for flows of the Coquille River East Fork below 10 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

11. The Coquille River Middle Fork or its tributaries above former USGS Gage 737 (NW 1/4 SE 1/4 Section 26, Township 29 South, Range 12 West), near Myrtle Point, Oregon for flows of the Coquille River Middle Fork below 15 cubic feet per second measured at the aformentioned gage site.

12. The Coquille River Middle Fork or its tributaries above the Coquille River Middle Fork - Sandy Creek confluence for flows of the Coquille River Middle Fork below 10 cubic feet per second measured at a point between said confluence and 1.0 miles above said confluence.

13. The Coquille River South Fork or its tributaries above USGS - Water Resources Department Gage 14-3250 (SE 1/4 Section 12, Township 31 South, Range 12 West), at Powers, Oregon for flows of the Coquille River South Fork below 22 cubic feet per second measured at the aforementioned gage site. (15 cubic feet per second during the period from June 16 to September 30.

14. The Coos River South Fork or its tributaries above the Coos River South Fork - McKnight Creek confluence for flows of the Coos River South Fork below 30 cubic feet per second measured at a point between said confluence and the Coos River South Fork - Salmon Creek confluence.

15. The Williams River or its tributaries for flows of the Williams River below 10 cubic feet per second measured at a point between the mouth and the Williams River - Bottom Creek confluence.

16. Tioga Creek or its tributaries for flows of the Tioga Creek below 4 cubic feet per second measured at a point between the mouth and the Tioga Creek - Shot Gun Creek confluence.

17. The Millicoma River East Fork or its tributaries for flows of the Millicoma River East Fork below 15 cubic feet per second measured at a point between the mouth and the Millicoma River East Fork - Marlow Creek confluence.

18. The Millicoma River West Fork or its tributaries for flows of the millicoma River West Fork below 6 cubic feet per second measured at a point between the mouth and the 2.0 miles above said mouth.

4935A

MID-COAST BASIN

1973
STATE WATER RESOURCES BOARD
MID COAST BASIN
MAP NO. 18.2
Miles
TILLAMOOK
POLK
LINCOLN
BENTON
LANE
DOUGLAS
OCEAN
PACIFIC
Nestucca
Grand Ronde
Otis
Neotsu
Devils Lake
Lincoln City
Kerville
Glenaden Bch.
Depoe Bay
Cape Perpetua
Otter Rock
Yaquina Head
Newport
Yaquina
Toledo
Elk City
Eddyville
Yaquina
Blodgett
Flynn
Philomath
Seal Rock
Alsea Bay
Waldport
Tidewater
Alsea
Yachats
Junction City
Cheshire
Roosevelt Beach
Blachly
Triangle Lake
Elmira
Veneta
EUGENE
Mercer Lake
Siuslaw
Swisshome
Mapleton
Welton
Florence
Glenada
Dunes City
Woahink Lake
Siltcoos Lake
Tahkenitch Lake
Lorane
Umpqua
Reedsport
Umpqua River

BEFORE THE WATER POLICY REVIEW BOARD OF OREGON

In the matter of formulating an integrated, coordinated program for the use and control of the water resources of the Mid-Coast Basin	)))))	Mid-Coast Basin May 8, 1981*

WHEREAS the State Water Resources Board under the authority of ORS 536.300 has completed a study of the Mid-Coast Basin as delineated on State Water Resources Board Map 18.6, dated 1964;

WHEREAS results of that study have been published in the State Water Resources Board Report, Mid-Coast Basin dated May 1965;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 adopted a program dated July 12, 1966 to classify the water resources of the Mid-Coast Basin;

WHEREAS the State Water Resources Board under the authority of ORS 536.300 and ORS 536.340 has undertaken a restudy of the Mid-Coast Basin as delineated on State Water Resources Board Map 18.6, dated 1972;

Whereas the Water Policy Review Board under the authority of ORS 536.340 may reclassify the water resources of the Mid-Coast Basin;

WHEREAS in all studies consideration was given to means and methods of augmenting, conserving, and classifying such water resources, existing and contemplated needs and uses of water for domestic, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses and for pollution abatement as well as other related subjects including drainage, reclamation, flood plains and reservoir sites; and

WHEREAS as a result of said studies the following findings have been reached by this Board:

I. Basinwide Findings

A. There is sufficient water supply on an annual yield basis to satisfy existing and future needs.

B. There is a seasonal distribution problem with insufficient water supply in many streams during the low flow months.

C. Industrial and irrigation are the major consumptive uses of water. Municipal demands are significant and are increasing.

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* Modifies Mid-Coast Basin Programs dated July 12, 1966, March 26, 1974 and March 10, 1975.

D. Shortages of surface water supply for irrigation occur during the low flow months.

E. Existing municipal water use is concentrated along the basin's littoral (coastal) fringe.

F. Shortages of suitable surface water supply for municipal purposes occur during the low flow months.

G. In many streams during the low flow season, remaining natural flows are less than minimum perennial streamflows recommended to sustain aquatic life.

H. Recommended minimum perennial streamflows during August through October can be met only through augmentation of existing low flows on most streams.

I. Increasing water use is creating significant water pollution problems during the low flow months.

J. Future water supply needs will be met, primarily by surface water, and will require storage of winter flows. Storage sites exist throughout the basin.

K. Industrial water demands within the next 15-20 years are not expected to be significantly greater than existing demands.

L. Known ground water supplies are of limited quantity throughout most of the basin. However, studies show that substantial quantities of variable quality ground water exist in some coastal and dune areas and that further investigation is warranted.

M. Ground water sources supplement some municipal water supplies during low flow months.

N. Existing use of water under domestic water rights, although small relative to annual yield of the streams, is of great importance.

O. Future large-scale domestic diversions would conflict with instream uses.

P. The hydroelectric potential of the basin that is feasible for development is small, because there are very few large-scale storage sites.

Q. Existing and potential water use for mining is small, because there are no commercial-size ore deposits.

R. Recreation is an important factor in the economy of the basin and will increase in importance in the future. Sport fishing is presently the leading water-based recreation. Recreational use of inland waters including coastal lakes is of major importance to the basin and is associated primarily with scenic attractions, sport fishing, boating, water skiing, and water contact sports.

S. Existing out-of-stream recreational water use is small, relative to existing streamflows.

T. Substantial potential exists for recreational water use both out-of-stream and instream.

U. Existing wildlife water use is small.

V. Potential exists for water use to enhance waterfowl habitat.

W. The existing anadromous fish resource of the basin is of national significance to both sport and commercial fishing.

X. Commercial fishing is important to the economy of the basin.

Y. Maintenance of adequate perennial streamflows is essential to the preservation of the anadromous fish resource. In many streams storage of winter flows will be necessary to provide adequate perennial streamflows.

Z. Improvement of streamflow to enhance water quality would be beneficial, but utilization of streamflows to minimize man-made pollution by dilution would conflict with other beneficial uses.

AA. Contamination of ground water creates serious health hazards in many populated areas not served by public water and sewer systems.

BB. Localized flooding, drainage, and streambank erosion problems exist.

CC. Classification of certain waters for limited-purpose use would be in the public interest.

II. Subbasin Findings

A. Salmon River - D River Drainages

1. Existing municipal water use is concentrated in the urbanized area of Lincoln City.

2. Future municipal water demands will arise from expansion of Lincoln City and creation of new rural domestic demands.

3. There is substantial acreage of potentially irrigable land in these drainages.

4. Existing irrigation water use is small, and there is no identified interest in developing additional irrigated acreage.

5. There are no identified current or contemplated industrial demands for water in the drainages.

6. Total existing rights are substantial when compared to streamflows during the low flow season.

7. Existing minimum perennial streamflow (established in 1966) in the Salmon River consists of one point at stream mile 5.

8. Present low flows in the Salmon River are less than one-half the amount recommended by the Wildlife Commission for minimum flows.

B. Siletz Bay Drainage

1. Municipal water use from Siletz River is mainly for the city of Siletz with a limited use by the city of Toledo.

2. Schooner Creek is the main source of municipal water for Lincoln City. Lincoln City has substantial municipal filings on Schooner Creek.

3. Drift Creek is the source of water for the Kernville - Gleneden Beach - Lincoln Beach Water District. This water district has substantial municipal filings on Drift Creek.

4. The existing municipal water rights on both Schooner and Drift Creeks, if totally utilized, would exceed measured low flows in both streams.

5. There are plans for future municipal demands for water from Siletz River to supply the Newport/Toledo region.

6. Substantial amounts of water are diverted for a single industry from the Siletz River for industrial use in Toledo.

7. Industrial rights on the Siletz River are subject to a State Engineer's order dated July 1956 which stipulates conditions for minimum perennial streamflows for protection of fish life.

8. There is substantial acreage of potentially irrigable land in the Siletz Bay drainage with the majority in the lower reaches of the Siletz River.

9. The acreage covered under existing water rights is only about 10 percent of the potentially irrigable land. Only one-half of the acreage covered under existing water rights is presently being irrigated.

10. There are existing out-of-stream diversions to support a fish hatchery on Rock Creek, a tributary of Siletz River.

11. Existing minimum perennial streamflow (established in 1966) in the Drift Creek drainage consists of one point at stream mile 2.5.

12. Existing minimum perennial streamflows (established in 1966) in the Siletz River drainage consist of three points -- one on the lower main stem Siletz River, one on the North Fork Siletz River, and one on the South Fork Siletz River.

13. The direct flow of Rock Creek and its tributaries above the north line of SW 1/4 NW 1/4, Section 7, Township 10 South, Range 8 West has been withdrawn by State Engineer's order July 22, 1960 from appropriation or storage during the months of July, August, or September of each year.

14. The future water demands from the Siletz River will have to be met from storage of winter flows during the low flow period if established minimum perennial streamflows are to be maintained.

C. Pacific Coast Drainages between Siletz Bay and Yaquina Bay

1. Municipal water use is concentrated in small communities along Highway 101.

2. Inadequacy of supply of individual small water systems will require development of a regional water system to meet future demands.

3. The waters of Little Creek and its tributaries have been withdrawn by State Engineer's order dated June 1960 for municipal use for Agate Beach.

4. There is no existing or contemplated industrial water use from these drainages.

5. There is no significant amount of land suitable for irrigation within these drainages.

6. There are no established minimum perennial streamflows nor are any recommended for any of the streams in this area.

7. These drainages cannot supply any continuous substantial water demands.

D. Yaquina Bay Drainage

1. The only existing municipal water use is from Mill Creek by the city of Toledo.

2. Plans for future municipal demands show sources to be outside the Yaquina drainage.

3. The waters of Mill Creek and its tributaries have been withdrawn by State Engineer's order dated December 1959 for municipal use for the city of Toledo.

4. Existing industrial water use is concentrated in the Toledo-Newport area.

5. The majority of the basin's industrial water is imported from the Siletz River for use at Toledo.

6. Wood products and fish processing will remain the primary industrial water use for the foreseeable future.

7. Most industries receive their water from established municipal systems.

8. Industrial rights on the Siletz River held by Georgia-Pacific are subject to a State Engineer's order dated July 1956. This stipulation provides conditions for minimum flows for protection of fish life.

9. There is substantial acreage of potentially irrigable land in the drainage. The majority is located along the upper Yaquina River and on Elk Creek.

10. About 30 percent of the potentially irrigable land is presently being irrigated, most of which is located on Elk Creek.

11. Existing minimum perennial streamflows (established in 1966) in the Yaquina River drainage consist of two points -- one on the main stem, the second on Elk Creek.

E. Pacific Coast Drainages between Yaquina Bay and Alsea Bay

1. Municipal water use is concentrated along Highway 101 and is mainly supplied by the Seal Rock Water District.

2. Increasing tourism along Highway 101 will be a significant factor in increased future municipal demands.

3. There are existing municipal water rights on Beaver Creek, Thiel Creek and Henderson Creek.

4. There are no existing or contemplated industrial water demands. An industrial water right on Beaver Creek is not in use.

5. There is only a small amount of acreage suitable for irrigation, most of which is in the Beaver Creek drainage.

6. About 50 percent of the land suitable for irrigation in the Beaver Creek drainage is presently being irrigated.

F. Alsea Bay Drainage

1. Municipal use in the Alsea drainage is concentrated in the cities of Waldport and Alsea.

2. Future demand for municipal water will be concentrated in Waldport and environs.

3. Lincoln County has adopted a plan to utilize Alsea River water to supply the municipal demands of the region.

4. There are no existing or contemplated industrial water demands.

5. In the Alsea watershed a substantial amount of potentially irrigable land exists with the majority found in the upper watershed.

6. About 30 percent of the potentially irrigable land is covered by existing water rights, however, only 10 percent of the acreage is being irrigated.

7. There are substantial existing out-of-stream diversions to supply fish hatcheries in the Fall Creek and North Fork Alsea watersheds.

8. Existing minimum perennial streamflows (established in 1966) in the Alsea River drainage consist of eight points -- two on Drift Creek, one at stream mile 21 on the main stem Alsea River, and one each on the North Fork Alsea River, South Fork Alsea River, Fall Creek, Five Rivers, and Lobster Creek.

9. The flows of the Alsea River during the low flow period will meet both the recommended minimum perennial streamflows and a limited amount of municipal water demands.

G. Yachats River Drainage

1. Municipal use is concentrated in the city of Yachats and along Highway 101.

2. The existing source of municipal water for Yachats is Reedy Creek, a tributary of the Yachats River.

3. Lincoln County has adopted a plan to utilize Yachats River water for municipal purposes.

4. There are no existing or contemplated industrial water demands.

5. There is substantial acreage of potentially irrigable land in the Yachats drainage.

6. Less than 10 percent of the potentially irrigable land is covered by existing water rights, and most of the acreage covered under existing water rights is presently being irrigated.

7. Existing minimum perennial streamflows (established in 1966) consist of three points -- two on main stem Yachats River and one on the North Fork Yachats River.

8. Due to existing water use and established minimum perennial streamflows no water will be available for future demands from the Yachats River during the low flow period.

H. Siuslaw River Drainage

1. Municipal water use is concentrated in the Florence area and is served by two major systems -- the city of Florence and Heceta Water District.

2. A large portion of the municipal water supply for the Florence area is from Clear Lake.

3. Existing municipal water use from Clear Lake has not created any adverse impacts on the lake.

4. Future municipal demands will result from growth of the city of Florence and environs.

5. Increased use of Clear Lake as a municipal water supply source is presently being considered by both Florence and Heceta Water District.

6. The existing industrial water use is concentrated in Mapleton and is supplied by the town of Mapleton.

7. Wood products and fish processing industries will constitute major future users of industrial water and will be mostly supplied by established municipal systems.

8. Substantial amounts of potentially irrigable land exist throughout the Siuslaw watershed with the exception of Wolf Creek Drainage.

9. Irrigation use is concentrated in Lake Creek and the North Fork Siuslaw River with lesser amounts scattered throughout the remaining watersheds. The present land being irrigated is less than 20 percent of the potentially irrigable land.

10. Existing minimum perennial streamflows (established in 1966) in the Siuslaw River drainage consist of seven points -- two each on the main stem Siuslaw River and Lake Creek, and one each on Wildcat Creek, Wolf Creek, and the North Fork Siuslaw River.

I. Woahink, Siltcoos, and Tahkenitch Lakes Drainages

1. Domestic water use is concentrated around Woahink and the northwest portions of Siltcoos Lakes.

2. Future municipal and domestic demands will arise primarily in the Dunes City area, and plans to utilize Woahink Lake as a municipal water supply source are being pursued.

3. The existing industrial use of water is substantial out of Tahkenitch and Siltcoos Lakes to supply a single industrial user located in Gardiner.

4. Future industrial use will probably be limited to an increase in use from the existing sources by the industrial user in Gardiner.

5. There is some potentially irrigable land in the Maple Creek, Fiddle Creek, and Tahkenitch Lake drainages.

6. Existing irrigated land amounts to less than 20 percent of the potentially irrigable land in the Maple Creek and Fiddle Creek drainages.

7. There are no established minimum perennial streamflow points in these natural lake drainages.

NOW THEREFORE BE IT RESOLVED that this Board hereby adopts the following program in accordance with the provisions of ORS 536.300(2) pertaining to the water resources of the Mid-Coast Basin:

A. The maximum economic development of this state, the attainment of the highest and best use of the waters of the Mid-Coast Basin, and the attainment of an integrated and coordinated program for the benefit of the state as a whole will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, wildlife and fish life uses with preference given to human consumption and livestock consumption over any other beneficial uses. The waters of the Mid-Coast Basin are hereby so classified with the following exceptions:

1. The waters of the following natural lakes of the Mid-Coast Basin are classified only for utilization of water for domestic, livestock, and in-lake uses for recreation, wildlife, and fish life purposes: Devils, Triangle, Lily, Sutton, Mercer, Collard, Munsel, Cleawox, Carter, Lost, Elbow, Clear, Woahink, Siltcoos, Tahkenitch, and Threemile.

2. The waters of the following lakes of the Mid-Coast Basin are reserved for municipal purposes in the amounts specified:

   a. Woahink Lake -- 1.5 cfs

   b. Clear Lake -- 1.5 cfs

3. The waters of the following streams and their tributaries are classified only for utilization of water for domestic, livestock, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development and instream uses for recreation, wildlife, and fish life purposes:

   a. Schoolhouse Creek (Mouth in Township 8 South)

   b. Fogarty Creek

   c. Deadhorse Creek

   d. Canal Creek of Alsea Bay

   e. Cummins Creek

   f. Bob Creek

   g. Tenmile Creek

   h. Big Creek at Roosevelt Beach

i. Cape Creek at Heceta Head

j. Quarry Creek

k. Knowles Creek of Siuslaw River

l. Hadsall Creek of Siuslaw River

m. Woahink Creek

n. Siltcoos River

o. Tahkenitch Creek

p. Threemile Creek

4. The waters of the following streams and their tributaries are classified only for utilization of water for domestic, livestock, municipal, irrigation of lawn or noncommercial garden not to exceed one-half acre in area, power development and instream uses for recreation, wildlife, and fish life purposes:

a. Salmon River

b. Schooner Creek of Siletz Bay upstream from the intersection of Schooner Creek and the section line between Section 25, Township 7 South, Range 11 West, WM, and Section 30, Township 7 South, Range 10 West, WM.

c. Drift Creek of Siletz Bay

d. Tributaries to Depoe Bay

e. Rocky Creek

f. Spencer Creek

g. Moolack Creek

h. Big Creek near Newport

i. Henderson Creek (Mouth in Township 11 South)

j. Thiel Creek

k. Beaver Creek (Mouth in Township 12 South)

l. Big Creek at San Marine

m. Vingie Creek

n. Starr Creek

o. Sutton Creek

p. Munsel Creek

5. The waters of Olalla Creek and its tributaries are classified for human consumption, livestock consumption, industrial, and instream uses for recreation, wildlife, and fish life purposes.

6. The waters of Schooner Creek and its tributaries downstream from the intersection of Schooner Creek and the section line between Section 25, Township 7 South, Range 11 West, WM, and Section 30, Township 7 South, Range 10 West, WM, are classified for domestic, livestock, municipal, irrigation and frost control not to exceed an additional total appropriation of 2.5 cfs, power development and instream uses for recreation, wildlife, and fish life purposes.

7. The waters of the following streams are reserved for municipal purposes in the amounts specified:

   a. Alsea River below stream mile 25 -- 5 cfs

   b. Yachats River below stream mile 5 -- 1 cfs

B. For the purpose of maintaining a minimum perennial streamflow sufficient to support aquatic life and recreation, no appropriations of water except for reservations in A-2 and A-6 above, human consumption, livestock consumption, or waters legally released from storage shall be made or granted by any state agency or public corporation of the state for the waters of the following streams and their tributaries for flows below the amounts specified:

Minimum Perennial Streamflows (cfs)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Salmon River												
Salmon River -- to be maintained from the confluence with Little Salmon River (SW 1/4 Section 15, Township 6 South, Range 9 West) to its confluence with Slick Rock Creek (NE 1/4 Section 35, Township 6 South, Range 10 West)												
30	80	95	95	65	65	65	65	65	30	20	15	15
Slick Rock Creek -- to be maintained in Slick Rock Creek at or near its confluence with the Salmon River (NE 1/4 Section 35, Township 6 South, Range 10 West)												
10	30	50	50	50	50	50	50	30	10	5	5	5
Bear Creek -- to be maintained in Bear Creek at or near its confluence with the Salmon River (SW 1/4 Section 34, Township 6 South, Range 10 West)												
2	4	25	25	25	25	25	25	10	4	2	2	2
* Salmon River -- to be maintained from its confluence with Slick Rock (NE 1/4 Section 35, Township 6 South, Range 10 West) to the mouth of the Salmon River												
60	150	150	150	120	120	120	120	120	80	50	35	30
Drift Creek												
* Drift Creek -- to be maintained from its confluence with Gordey Creek (NE 1/4 Section 1, Township 8 South, Range 11 West) to the mouth of Drift Creek												
30	80	100	100	100	100	100	100	100	40	25	22	22

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept

Siletz River

Siletz River -- to be maintained at or near its confluence with the South Fork Siletz River (NE 1/4 Section 18, Township 8 South, Range 8 West)

60	120	120	120	120	120	120	120	80	60	40	40	35

*South Fork Siletz River -- to be maintained in South Fork Siletz River at or near its confluence with the Siletz River (NE1/4 Sec. 18, T 8 S, R 8 W)

30	40	60	60	60	60	60	60	60	30	10	10	10

Gravel Creek -- to be maintained in Gravel Creek at or near its confluence with the Siletz River (NW 1/4 Section 18, Township 8 South, Range 8 West)

10	40	60	60	60	60	60	60	40	20	5	5	5

Siletz River -- to be maintained from its confluence with the South Fork Siletz River (NE 1/4 Section 18, Township 8 South, Range 8 West) to its confluence with Sunshine Creek (SE 1/4 Section 3, Township 9 South, Range 9 West)

70	140	190	190	140	140	140	140	140	70	70	50	50

Siletz River -- to be maintained from its confluence with Sunshine Creek (SE 1/4 Section 3, Township 9 South, Range 9 West) to USGS - State Engineer Gage 14-3055 at stream mile 42.6 (SW 1/4 Section 11, Township 10 South, Range 10 West)

120	190	200	200	170	170	170	170	170	100	100	80	80

Mill Creek -- to be maintained in Mill Creek at or near its confluence with the Siletz River (NE 1/4 Section 33, Township 9 South, Range 9 West)

20	40	50	50	40	40	40	40	20	5	5	5	5

Rock Creek -- to be maintained in Rock Creek at or near its confluence with the Siletz River (NE 1/4 Section 4, Township 10 South, Range 9 West)

25	50	70	70	50	50	50	50	30	25	15	10	10

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
	Sam Creek -- to be maintained in Sam Creek at or near its confluence with the Siletz River (SE 1/4 Section 1, Township 10 South, Range 10 West)											
15	40	50	50	40	40	40	40	25	15	5	5	5
	*Siletz River -- to be maintained from USGS - State Engineer Gage 14-3055 at stream mile 42.6 (SW 1/4 Section 11, Township 10 South, Range 10 West) to the mouth of the Siletz River											
150	200	220	220	200	200	200	200	200	135	100	100	100
	Euchre Creek -- to be maintained in Euchre Creek at or near its confluence with the Siletz River (SE 1/4 Section 16, Township 9 South, Range 10 West)											
20	50	80	80	60	60	60	60	40	20	10	10	10
	Cedar Creek -- to be maintained in Cedar Creek at or near its confluence with the Siletz River (SW 1/4 Section 8, Township 9 South, Range 10 West)											
30	60	70	70	60	60	60	60	40	30	15	15	15
	Bear Creek -- to be maintained in Bear Creek at or near its confluence with the Siletz River (SW 1/4 Section 16, Township 8 South, Range 10 West)											
3	3	15	15	15	15	15	15	10	5	3	2	2

Yaquina River

	Yaquina River -- to be maintained from its confluence with Bales Creek (SE 1/4 Section 26, Township 10 South, Range 9 West) to its confluence with Simpson Creek (NE 1/4 Section 36, Township 10 South, Range 10 West)											
20	50	90	90	50	50	50	50	35	20	10	10	10

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Little Elk Creek -- to be maintained in Little Elk Creek at or near its confluence with the Yaquina River (NW 1/4 Section 10, Township 11 South, Range 9 West)												
15	40	60	60	50	50	50	40	30	15	5	5	5
Simpson Creek -- to be maintained in Simpson Creek at or near its confluence with the Yaquina River (NE 1/4 Section 36, Township 10 South, Range 10 West)												
15	30	40	40	30	30	30	30	20	15	4	4	4
* **Yaquina River** -- to be maintained from its confluence with Simpson Creek (NE 1/4 Section 36, Township 10 South, Range 10 West) to the mouth of the Yaquina River												
30	70	90	90	50	50	50	50	35	25	18	18	18
Elk Creek -- to be maintained from its confluence with Grant Creek (SW 1/4 Section 7, Township 12 South, Range 8 West) to the confluence of Bear Creek (NW 1/4 Section 30, Township 11 South, Range 9 West)												
20	40	50	50	50	50	50	50	30	20	10	10	10
*Elk Creek -- to be maintained from its confluence with Bear Creek (NW 1/4 Section 30, Township 11 South, Range 9 West) to the confluence with the Yaquina River (NW 1/4 Section 14, Township 11 South, Range 10 West)												
30	60	80	80	80	80	80	80	50	35	15	15	15
Alsea River												
* North Fork Alsea River -- to be maintained in North Fork Alsea River at or near its confluence with the Alsea River (SE 1/4 Section 1, Township 14 South, Range 8 West)												
25	70	90	90	70	70	70	70	50	30	20	18	18

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
* South Fork Alsea River -- to be maintained in South Fork Alsea River at or near its confluence with the Alsea River (SE 1/4 Section 1, Township 14 South, Range 8 West)												
20	60	80	100	100	100	100	100	60	50	10	10	10
Bummer Creek -- to be maintained in Bummer Creek at or near its confluence with the South Fork Alsea River (NE 1/4 Section 12, Township 14 South, Range 8 West)												
10	20	60	60	40	40	40	40	25	15	4	4	4
Alsea River -- to be maintained from its confluence with South Fork Alsea River (SE 1/4 Section 1, Township 14 South, Range 8 West) to USGS - State Engineer Gage 14-3065 at stream mile 17.2 (NW 1/4 Section 6, Township 14 South, Range 9 West)												
50	100	140	140	130	130	130	130	85	50	25	25	25
* Fall Creek -- to be maintained from its confluence with Carns Canyon Creek (NW 1/4 Section 35, Township 13 South, Range 9 West) to its confluence with the Alsea River (SW 1/4 Section 1, Township 14 South, Range 9 West)												
20	50	100	100	80	80	80	80	50	35	15	8	8
Green River -- to be maintained in Green River at or near its confluence with Five Rivers (SE 1/4 Section 8, Township 15 South, Range 9 West)												
10	30	60	60	50	50	50	50	25	10	5	5	5
Five Rivers -- to be maintained from its confluence with Green River (SE 1/4 Section 8, Township 15 South, Range 9 West) to its confluence with Lobster Creek (SW 1/4 Section 19, Township 14 South, Range 9 West)												
20	60	115	115	100	100	100	100	60	25	10	10	10

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
	* Lobster Creek -- to be maintained in Lobster Creek at or near its confluence with Five Rivers (SW 1/4 Section 19, Township 14 South, Range 9 West)											
15	30	80	80	60	60	60	60	30	15	15	10	10
	* Five Rivers -- to be maintained from its confluence with Lobster Creek (SW 1/4 Section 19, Township 14 South, Range 9 West) to its confluence with the Alsea River (SW 1/4 Section 7, Township 14 South, Range 9 West)											
40	80	140	140	140	140	140	140	100	50	30	25	25
	* Alsea River -- to be maintained from USGS - State Engineer Gage 14-3065 at stream mile 17.2 (NW 1/4 Section 9, Township 14 South, Range 9 West) to the mouth of the Alsea River											
100	150	150	150	150	150	150	150	100	100	90	90	90
	* Drift Creek -- to be maintained from its confluence with Wheelock Creek (NW 1/4 Section 24, Township 13 South, Range 11 West) to its confluence with the Alsea River (NE 1/4 Section 27, Township 13 South, Range 11 West)											
25	90	130	130	110	110	110	110	70	45	20	15	15
	Yachats River											
	* North Fork Yachats River -- to be maintained in the North Fork Yachats River at or near its confluence with the Yachats River (SW 1/4 Section 35, Township 14 South, Range 11 West)											
10	20	30	35	35	35	35	35	20	10	5	5	5
	* Yachats River -- to be maintained from its confluence with the North Fork Yachats River (SW 1/4 Section 35, Township 14 South, Range 11 West) to its confluence with Beamer Creek (SE 1/4 Section 32, Township 14 South, Range 11 West)											
20	40	50	60	50	50	50	50	30	20	10	10	10

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
* Yachats River -- to be maintained from its confluence with Beamer Creek (SW 1/4 Section 32, Township 14, Range 11 West) to the mouth of the Yachats River												
25	50	70	70	65	65	65	65	40	30	20	15	15

Tributaries to the Pacific Ocean

Tenmile Creek -- to be maintained in Tenmile Creek at or near its mouth												
15	30	45	55	55	55	55	55	30	20	10	10	10
Big Creek -- to be maintained in Big Creek at or near its mouth												
10	20	40	65	65	65	65	60	40	20	10	5	5
Cape Creek -- to be maintained in Cape Creek at or near its mouth												
10	20	35	55	55	55	55	50	30	10	10	5	5

Siuslaw River

Siuslaw River -- to be maintained from its confluence with the North Fork Siuslaw River (SW 1/4 Section 14, Township 20 South, Range 5 West) to its confluence with Haight Creek (SW 1/4 Section 35, Township 19 South, Range 7 West)												
10	20	75	75	75	75	75	50	30	20	10	5	5
Siuslaw River -- to be maintained from its confluence with Haight creek (SW 1/4 Section 35, Township 19 South, Range 7 West) to its confluence with Wolf Creek (SE 1/4 Section 35, Township 18 South, Range 8 West)												
30	60	100	100	100	100	100	100	70	55	40	20	20

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
	Esmond Creek -- to be maintained in Esmond Creek at or near its confluence with the Siuslaw River (SW 1/4 Section 9, Township 19 South, Range 8 West)											
5	15	30	50	50	50	50	50	30	15	6	3	3
	* Wolf Creek -- to be maintained in Wolf Creek at or near its confluence with the Siuslaw River (SE 1/4 Section 35, Township 18 South, Range 8 West)											
10	25	80	80	60	60	60	60	40	25	18	7	7
	* Siuslaw River -- to be maintained from its confluence with Wolf Creek (SE 1/4 Section 35, Township 18 South, Range 8 West) to its confluence with Lake Creek (NE 1/4 Section 32, Township 17 South, Range 9 West)											
45	90	180	180	180	180	180	180	140	100	60	30	35
	Whittaker Creek -- to be maintained in Whittaker Creek at or near its confluence with the Siuslaw River (SE 1/4 Section 21, Township 18 South, Range 8 West)											
5	15	30	50	60	60	60	40	20	10	5	3	3
	* Wildcat Creek -- to be maintained in Wildcat Creek at or near its confluence with the Siuslaw River (SE 1/4 Section 16, Township 18 South, Range 8 West)											
10	25	80	120	70	70	70	70	45	25	10	8	8
	Indian Creek -- to be maintained in Indian Creek at or near its confluence with Lake Creek (NW 1/4 Section 21, Township 17 South, Range 9 West)											
15	50	100	160	160	160	160	160	80	50	20	15	15

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
* Siuslaw River -- to be maintained from its confluence with Lake Creek (NE 1/4 Section 32, Township 17 South, Range 9 West) to the mouth of the Siuslaw River												
95	250	320	320	260	260	260	260	215	160	95	95	95
Knowles Creek -- to be maintained in Knowles Creek at or near its confluence with the Siuslaw River (SE 1/4 Section 2, Township 18 South, Range 10 West)												
5	20	30	30	30	30	30	30	20	10	5	5	5
Sweet Creek -- to be maintained from its confluence with Cedar Creek (NW 1/4 Section 28, Township 18 South, Range 10 West) to its confluence with the Siuslaw River (SE 1/4 Section 8, Township 18 South, Range 10 West)												
5	30	45	45	45	45	45	45	30	15	5	5	5
North Fork Siuslaw River -- to be maintained from its confluence with Cedar Creek (NE 1/4 Section 32, Township 16 South, Range 10 West) to its confluence with McLeod Creek (NW 1/4 Section 25, Township 17 South, Range 11 West)												
5	30	45	45	45	45	45	45	35	20	8	5	5
* North Fork Siuslaw River -- to be maintained from its confluence with McLeod Creek (NW 1/4 Section 25, Township 17 South, Range 11 West) to its confluence with the Siuslaw River (SW 1/4 Section 25, Township 18 South, Range 12 West)												
15	60	70	70	70	70	70	70	45	25	12	12	10
* Lake Creek -- to be maintained from Triangle Lake (SW 1/4 Section 20, Township 16 South, Range 7 West) to its confluence with Indian Creek (NW 1/4 Section 21, Township 17 South, Range 9 West)												
8	20	60	90	90	90	90	90	60	30	15	8	8

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Fish Creek -- to be maintained in Fish Creek at or near its confluence with Lake Creek (SE 1/4 Section 30, Township 16 South, Range 7 West)												
5	10	30	40	30	30	30	30	15	10	5	3	3
Greenleaf Creek -- to be maintained in Greenleaf Creek at or near its confluence with Lake Creek (NE 1/4 Section 2, Township 17 South, Range 8 West)												
7	15	30	60	60	60	60	60	30	15	7	5	5
Nelson Creek -- to be maintained in Nelson Creek at or near its confluence with Lake Creek (SW 1/4 Section 9, Township 17 South, Range 8 West)												
7	15	40	70	40	40	40	40	25	15	10	5	5
* **Lake Creek** -- to be maintained from its confluence with Indian Creek (NW 1/4 Section 21, Township 17 South, Range 9 West) to its confluence with the Siuslaw River (NE 1/4 Section 32, Township 17 South, Range 9 West)												
50	180	260	260	260	260	260	260	175	120	70	50	50
Deadwood Creek -- to be maintained in Deadwood Creek at or near its confluence with Lake Creek (NE 1/4 Section 15, Township 17 South, Range 9 West)												
15	40	80	130	100	100	100	100	65	40	20	15	15

Siltcoos Lake Drainage

Woahink Creek -- to be maintained from the outlet of Woahink Lake (NE 1/4 Section 27, Township 19 South, Range 12 West) to its confluence with Siltcoos Lake (SE 1/4 Section 27, Township 19 South, Range 12 West)												
5	15	20	20	20	20	20	20	10	10	5	5	5

* Modifies minimum perennial streamflows established on July 12, 1966.

Minimum Perennial Streamflows (cfs)
(continued)

Oct 1-15	Oct 15-31	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Maple Creek -- to be maintained from its confluence with Jordan Creek (SE 1/4 Section 9, Township 19 South, Range 11 West) to Siltcoos Lake (NW 1/4 Section 30, Township 19 South, Range 11 West)												
3	8	12	12	12	12	12	12	10	8	3	3	3
Fiddle Creek -- to be maintained from its confluence with Alder Creek (SE 1/4 Section 32, Township 19 South, Range 11 West) to Siltcoos Lake (NW 1/4 Section 7, Township 20 South, Range 11 West)												
3	10	10	10	10	10	10	10	10	5	3	3	3
Tahkenitch Lake Drainage												
Fivemile Creek -- to be maintained from its confluence with Perkins Creek (NE 1/4 Section 25, Township 20 South, Range 12 West) to Tahkenitch Lake (SW 1/4 Section 26, Township 20 South, Range 12 West)												
3	5	10	10	10	10	10	10	10	5	3	3	3
Leitel Creek -- to be maintained in Leitel Creek at or near Tahkenitch Lake (NE 1/4 Section 3, Township 21 South, Range 12 West)												
2	5	10	10	10	10	10	10	5	5	2	2	2

* Modifies minimum perennial streamflows established on July 12, 1966.

4896A

C. All applications for appropriation of water for storage in structures impounding more than 3,000,000 gallons of water shall be reviewed by the Water Policy Review Board prior to approval. During the review the Water Policy Review Board may establish additional minimum flows on the natural flow of the stream to support aquatic life or minimize pollution.

D. To support present and proposed Mid-Coast Basin water resource development, no out-of-basin appropriation of the waters of the Mid-Coast Basin shall be made or granted by any state agency or public corporation of the state without the prior approval of, and following a public hearing by, the Water Policy Review Board.

E. Applications for the use of the waters of the Mid-Coast Basin shall not be accepted by any state agency for any purposes contrary to the classifications herein specified, and the granting of applications for such other purposes is declared to be prejudicial to the public interest, and the granting of applications for such other uses would be contrary to this water use program.

F. Rights to use of water granted by any state agency in accordance with this water use program shall be issued only on the condition that any effluents or return flows from such uses shall not interfere with other beneficial uses of water.

G. Structures or works for utilization of the waters in accordance with the aforementioned classifications are also declared to be prejudicial to the public interest unless planned, constructed, and operated in conformity with the applicable provisions of ORS 536.310; and any such structures or works, which do not give cognizance to the multiple-purpose concept, are further declared to be prejudical to the public interest.

H. The minimum perennial streamflows established by the July 12, 1966 Mid-Coast Basin Program shall remain in effect over appropriations issued from July 12, 1966 to March 26, 1974.

Done and dated this 8th day of May , 1981.

WATER POLICY REVIEW BOARD

By _____

Donel J. Lane, Chairman

4896A

PACIFIC NORTHWEST UTILITIES CONFERENCE COMMITTEE

Interim Report to Pacific Northwest Electric Power and Conservation Planning Council

Report No. 1

From Pacific Northwest Utilities Conference Committee

Fish and Wildlife Committee
November, 1981

Pacific Northwest Utilities Conference Committee

November 17, 1981

Hon. Dan Evans, Chairman
Pacific Northwest Electric Power and
Conservation Planning Council
Carrage House, 700 SW Taylor
Portland, OR

Dear Chairman Evans,

Enclosed is an Interim Report to the Regional Power Planning Council on fish and wildlife issues developed by the PNUCC Fish and Wildlife Committee. This report is offered as an interim effort presenting generalized views, concerns, and discussion on anadromous fish, resident fish and wildlife. The report is the first of a number planned by the Committee to assist the Council in its development of a fish and wildlife program required under Section 4(h) of Public Law 96-501.

In keeping with the spirit of positive assistance to the Council, the Committee is planning the following activities over the next year:

1. The Committee will review the detailed fishery recommendations and will develop as many areas of compatible or acceptable programs as possible. In those areas where program recommendations are incompatible with power production interests, the Committee will attempt to identify as much "common ground" or compromise programs as possible.

2. The Committee plans periodic reports to the Council on positions and recommendations for the fish and wildlife program throughout the next twelve months.

3. A key subject which the PNUCC Fish and Wildlife Committee is very concerned about is the impact of instream flows for fisheries on hydroelectric generation on Columbia and Snake systems. Because of the magnitude and complexity of this issue, the Committee will not be submitting an impact analysis of flows at this time. However, the Committee is sponsoring a special task force of PNUCC power

management personnel to work with the Council, the Corps of Engineers, BPA, the fisheries agenices and others to help solve the problems associated with providing water for fisheries resources while still maintaining flows to provide a reliable power supply.

The PNUCC Fish and Wildlife Committee would like to reaffirm its commitment to the Regional Power Planning Council of positive cooperation in the development of a fish and wildlife program to protect, mitigate, and enhance fish and wildlife on the Columbia River and tributaries while assuring the region an economical, efficient, adequate an reliable power supply.

Very truly yours,

Al Wright

Al Wright, Chairman
PNUCC Fish and Wildlife Committee

REPORT TO

PACIFIC NORTHWEST ELECTRIC POWER
AND
CONSERVATION PLANNING COUNCIL

INTERIM REPORT FROM

PACIFIC NORTHWEST UTILITIES CONFERENCE COMMITTEE

Fish and Wildlife Committee

Report Number 1

November 1981

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INTRODUCTION

This report by the Pacific Northwest Utilities Conference Committee is an interim effort. It does not completely reflect the supportive interest, efforts already expended, or the intended commitment of the Committee to be a positive contributor to the Council in preparing the fish and wildlife program required by Section 4(h) of Public Law 96-501. Recognizing, however, that the call for program recommendations merely initiates the program planning process that will follow in the next year, the Committee believes that a broader, generalized approach is more appropriate at this time. Therefore, this report was prepared and is submitted with the anticipation of subsequent and much more substantive contributions.

ROLE OF PNUCC

This document has been prepared by the Pacific Northwest Utilities Conference Committee (PNUCC) Fish and Wildlife Committee (the Committee) to address issues within the requirements of Section 4(h) of the Pacific Northwest Electic Power Planning and Conservation Act, Public Law 96-501 (the Act). Contents herein are to assist the Regional Planning Council (as established under the Act) in developing a fish and wildlife program in accordance with Section 4(h) of the Act. This section of the Act presents a unique opportunity to benefit the fish and wildlife resources of the Columbia River system by establishing energy standards which protect, mitigate and enhance fish and wildlife affected by hydroelectric development.

The PNUCC is a long-standing organization of public and private utilities and direct service industries; other water managers, such as the US Army Corps of Engineers, US Bureau of Reclamation, and Bonneville Power Administration are unofficially represented on the PNUCC. The PNUCC formed the Fish and Wildlife Committee soon after passage of the Act. The immediate objective assigned to the Committee of utility-related biologists and environmental representatives was to furnish the Regional Planning Council with appropriate recommendations with respect to fish and wildlife. Further, it is the goal of the Committee to coordinate with other interested parties in the development of reasonable recommendations and to assist the Council in the development and implementation of the fish and wildlife program which meets the Congressional intent of the Act. The Fish and Wildlife Committee of the PNUCC represents a substantial resource with pertinent biological and environmental expertise.

SECTION 4(h) - PNUCC PERSPECTIVE

Section 4(h) of the Act provides a major, new planning process for considering fish and wildlife requirements on a system-wide basis. The workability of this process is enhanced by the requirement that program recommendations provide "detailed information" and be supported by "the best

available scientific knowledge". Section 4(h) also sets forth the clear requirement for balancing the needs of fish and wildlife with the needs for electrical power. This balance has been clarified by the requirement that the fish and wildlife program also assure an "adequate, efficient, and reliable" power supply. By adding the word "economical" to those requirements, Congress specified that there was no intent for program measures to create unreasonable power costs or losses. The Act also provides for balancing the fish and wildlife program with other river uses and in consideration of treaty obligations.

The Act creates procedural changes for considering fish and wildlife concerns related to hydroelectric development. That is, the Council is directed to establish a planning process that incorporates criteria for developing workable program measures for inclusion in the plan, a method of paying for such measures, and a standard for consideration of fish and wildlife concerns of the Columbia River system. The Act further requires federal agencies to (1) consider the program within their decision-making authority and (2) coordinate such actions, consistent with all purposes of the Act.

ORGANIZATION OF REPORT

The remainder of this report will cover the following:

(1) a brief history of the fish protection, mitigation, and enhancement programs already undertaken in the Columbia River system by power interests;
(2) a description of the current condition of the system's fisheries resource,
(3) a description of the factors affecting the system's resident fish and wildlife,
(4) an outline of considerations that should be incorporated into the planning process by the Regional Planning Council.

ANADROMOUS FISH

HISTORY OF PROTECTION, MITIGATION AND ENHANCEMENT

Hydroelectric projects affecting anadromous fish have responsibilities stipulated in their Federal Energy Regulatory Commission (FERC) licenses for non-federal projects, or mandated by Congressional law for federal projects. These responsibilities require these projects to conserve, protect and perpetuate the anadromous fish resources, and to provide mitigation for impacts to these resources at their respective projects.

Beyond these specific legal obligations the utility industry has spent and is committed to spending reasonable levels of energy and dollars to accommodate other river uses, such as fish and wildlife. The following sections outline some of the actions that have been taken by the utilities.

Specific Programs

Generally, anadromous fish mitigation and passage facilities were constructed concurrently with the construction of the projects. Operation and maintenance funds for those facilities were provided by the projects as well. For example, Mid-Columbia River adult fish ladders and spawning channel/hatchery facilities were created in this manner at the PUD projects. A major portion of the power producers' expenditures on fish goes to hatchery production. As of 1976, forty-six out of fifty-five hatcheries in the Columbia Basin were constructed with funds from the power producers to compensate for inundation of spawning grounds and fish losses.

While many hatchery facilities were constructed as mitigation, some of these facilities produce in excess of what is required for mitigation. For example, since 1970, Idaho Power Company hatcheries have taken over 116,000,000 chinook salmon eggs and 53,000,000 steelhead trout eggs. Their facilities have provided over 40 percent of these eggs to be utilized by the fisheries agencies for enhancement.

The three mid-Columbia PUD's have constructed massive spawning channels as agency required mitigation for the construction of their projects. These spawning channels proved unsuccessful. Subsequently, the utilities provided hatchery operations to comply with the spirit of the mitigation rather than the minimum legal requirements. More recently, the utilities have provided significant capital improvements for the conversion of these channels to juvenile rearing facilities. These improvements have been greater than the requirements of FERC agreements. Through these actions and expenditures the utilities have demonstrated a commitment to preservation and protection of the biological resource.

Idaho Power Company has gone beyond basic production of fish to fund a very successful bacterial kidney disease (BKD) eradication program at its Rapid River Hatchery. Once a problem, BKD has virtually been eliminated as a cause of pre-spawning mortality at the hatchery. Idaho Power's funding of this program has generated additional grants to the University of Idaho, the agency studying BKD at Rapid River. Idaho Power Company's funding of fish disease research continues at the University of Idaho and is a major benefit to all regional fishery interests.

In addition to production oriented mitigation efforts, the power producers have been active in research for the best methods of fish protection and propagation. The direction of this research has changed considerably since it began in the 1930's. During the earlier years attention was generally focused on adult fish collection and passage facilities (fish ladders). Later (1950's), more attention was given to the survival of juvenile salmon as they migrated downstream. This downstream migration research consisted primarily of dissolved gas supersaturation studies during the late 1960's and early 1970's. Most recently (late 1970's and on) the downstream migrant research has focused on juvenile survival passing through the dams, migration rates, juvenile fish behavior during dam passage and transportation/imprinting studies.

In the past, most of the research was conducted by the National Marine Fisheries Service, the Corps of Engineers, state fish and game agencies, universities, and private consultants, but was funded by the power producers. Recently, the power producers have hired numerous highly trained biologists, engineers, and scientists to manage their fish and wildlife programs and as a result have assumed responsiblity for conducting some of their own research (Table 1). The Corps of Engineers, alone, employs 35 fish and wildlife biologists. The result of the work conducted by these scientists has complemented and often led research conducted by fishery agencies. These efforts by the power producers have become a great asset to the salmonid fisheries in the Columbia Basin. Much of what is known today about the salmonids in the Columbia River system has resulted from programs funded by the power producers.

Capital, Maintenance and Operation Costs

Beginning with the development of the first dam on the Columbia River, Rock Island Dam in 1933, the owners and operators of Columbia Basin hydroelectric dams have incorporated facilities and measures for fish and wildlife protection and propagation requiring large sums of money. The power producers have spent over $370 million (actual dollars expended not adjusted for inflation) for these programs through 1975. In addition, expenditures of over $14 million are currently incurred annually in operation and maintenance costs. The power producers have financed most of the hatchery construction in the Columbia Basin and provide 40% of the operation and maintenance of these facilities (Table 2). The power producers are also involved in research of the best fish protection methods and monitoring of salmonid migrations. Since 1951 the Corps of Engineers has spent over $27 million on fisheries research and is currently spending between $2 and $3 million annually. In addition to these direct

Table 1 Numbers of Professional Research Staff[1] Dealing With Fish and Wildlife Concerns.

Entity	Full Time	Temporary or Part Time
Bonneville Power Administration	7	7
Bureau of Reclamation	-	-
Chelan County PUD	4	8
Corps of Engineers	35	-
Douglas County PUD	2	7
Eugene Water & Electric Board	1	-
Grant County PUD	2	3
Idaho Power	13	6
Montana Power	4	4
Pacific Power and Light	8	-
PNUCC Staff	-	-
Portland General Electric	-	-
Puget Sound Power and Light	11	3
Seattle City Light	1	1
Snohomish County PUD	1	-
Tacoma City Light	1	-
Washington Water Power	4	3

[1] Additional staff within state agencies are funded by the power producers.

Table 2 Cost[1] of Operating Salmon and Steelhead Hatcheries in the Columbia Basin and Source of FY 1974 Funding

Operating Agency	State	Public and Private Utilities	Corps of Engineers	FWS[2]	NMFS[3]	Totals
FWS			$ 1,133,200	$ 565,800	$ 858,600	$ 2,557,600
IDAHO		$ 255,740		28,275	33,000	317,015
OREGON	$ 328,172	73,109	362,255		919,895	1,683,431
WASHINGTON	192,584	824,320			877,382	1,894,286
TOTALS	$ 520,756	$ 1,153,169	$ 1,459,455	$ 594,075	$ 2,688,877	$ 6,452,332
PERCENTAGES	8.1%	17.9%	23.2%	9.2%	41.7%	100%

1 Operation and maintenance, including overhead, construction cost not included. Replacement cost estimated at more than $180,000,000 (1974 Dollars)

2 Fish and Wildlife Service

3 National Marine Fisheries Service

From: A Question of Balance: Columbia Basin Salmon Steelhead Analysis. Summary Report, 1976, Pacific Northwest Regional Commission

expenditures the power producers incur lost revenue due to spill and turbine manipulation during the spring salmonid out migration. These actions show that the power producers have given considerable monetary support for the protection and propagation of Columbia Basin fish and wildlife.

PRESENT RESOURCE STATUS

Definition of Resource

The anadromous fish resources of the Columbia River system upstream of Bonneville Dam include chinook salmon (spring, summer, and fall runs) coho salmon, sockeye salmon, steelhead trout and shad. The resources include all individuals of each race of these populations at each stage in their life cycle from the embryos to the mature adult fish. The resource includes both their freshwater and saltwater life stages and habitats occupied by the various life stages of these species; spawning and rearing which occur primarily in the tributaries; migration routes down these tributaries and the mainstem river; estuarine adaptation and coastal rearing; offshore rearing; and adult upstream migration routes. Activities affecting any portion of these habitats could affect production and the number of adult fish returning to the spawning habitat.

Historical Run Sizes, Long Term Trends

The Fish and Wildlife Committee wishes to emphasize three major points in this section: (1) interpretation of run size data is unavoidably complex due to the varying quality of data collection over the years and the incomplete understanding of the total system dynamics, (2) the utilities agree with the fisheries agencies that the resource is now in a poor condition, (3) historical data exists that indicate that the past and present depressed conditions of the anadromous fish runs are influenced by many factors. The following dicussion is not intended to be a definitive treatment of the subject but rather an attempt to give the Council an understanding of some of the data and concepts that do exist. The Committee will provide a more rigorous analysis in the next several months as we continue to participate in the Council's formulation of the fisheries program.

One of the best indications of run size prior to major development on the river is provided through commercial river harvest data from lower river fishing operations. The earliest record of annual commercial landings is 1866. From 1866 to 1888 chinook (primarily summer run) was the only species harvested commercially (Craig and Hacker, 1940). After 1888, sockeye, steelhead, coho and chum comprised a substantial portion of the commercial harvest. The shift to these species appears to have been triggered by a decline in summer chinook toward the end of the 1880's. This early decline has been explained by the overharvest of the summer chinook.

Annual commercial landings of salmon during 1876-1930 averaged about 33.75 million pounds. The peak harvest occurred in 1911 when 49.5 million

pounds were taken. In 1928 a gradual decreasing trend began in the numbers and poundage of salmon and steelhead commercially harvested in the Columbia River. During the 1930's and 1940's, the annual average river harvest was approximately 25 and 20 million pounds respectively. Subsequent to the 1940's commercial harvest in the lower Columbia River has not exceeded 10 million pounds annually. During this later period, both commercial and sports harvests of salmon in the ocean increased, hydroelectric projects were constructed, agricultural and silvicultural development occurred, and industrialization and urbanization increased. All of these factors contribute to the declining trend. While it is impossible to define the exact causes and relative responsibility of this declining trend, it is important to note that the beginning of the trend was prior to the completion of the first dam on the Columbia River. In addition to the trends indicated through commercial harvest data, substantial decreases occurred in runs indigenous to tributaries upstream from Rock Island Dam prior to the dam's construction (Beiningen, 1976). This conclusion is supported through adult counts made at Rock Island Dam from 1933-38 which indicate many less chinook, sockeye and steelhead passed the dam than the watershed above Grand Coulee was capable of supporting prior to its construction in the late 1930's.

Ocean Harvest

The percentage of Columbia River salmon harvested in the ocean fishery has not been precisely determined; however, some estimates have been made. Depending on the stock, it is estimated that between two and six fish of Columbia River origin are taken in the ocean for each one returning to the river (Beiningen, 1976). Through 1974, over half the total poundage of chinook and coho released from Pacific Coast hatcheries came from Columbia River stations, meaning that the increasing ocean harvest of salmon depends heavily on fish produced in the Columbia River.

Little is known concerning the contribution of Columbia River wild stocks to the ocean fishery. The results of hatchery studies indicate that a substantial but undefined portion of the wild stocks are harvested in the ocean fishery. The advances being made in genetic identification of salmon stocks may allow a better answer to this issue in the future.

The historical data for ocean-harvested salmon along the Pacific Coast indicate a trend opposite of the trend in the river fishery. In general, since 1960 there has been a steady increase in numbers of commercial and sports harvested salmon during their ocean migration. This increasing trend, for the most part, can be attributed to increases in the number of fishermen as well as to the development of more sophisticated fishing vessels and technology. This increased salmon harvest along the Pacific Coast has had a substantial impact on the salmon stocks of the Columbia River due to their contribution to the ocean fishery.

Effectively protecting fish stocks that have been reduced to low numbers is an inherent problem with a mixed stock fishery. Wide oceanic distribution of selected stocks creates additional interstate and international management

problems when trying to protect a stock reduced to low numbers. For example, Columbia River fall chinook are taken simultaneously in significant numbers in fisheries from northern Oregon to southeastern Alaska (Pacific Northwest Regional Commission, 1976). In 1966, about one out of every five chinook landed in the commercial troll fishery off Vancouver Island, Canada originated from a Columbia River hatchery (Beiningen, 1976). Coho salmon from the Columbia system are distributed from northern California to southern British Columbia at the same time (Senn and Noble, 1968).

Escapement Trends

In recent years mid-Columbia stocks of spring and summer chinook and steelhead have had increased escapement from their pre-1950's level, whereas Snake River stocks have continued to decline. An effective means of estimating escapement became available with the completion of Rock Island Dam in 1933 and Bonneville Dam in 1938 when adult passage counts were initiated. Long term trends of adult counts past Bonneville Dam have been relatively stable for chinook and steelhead, and to a lesser extent sockeye during 1938-1975. Adult counts of coho have shown a dramatic increase recently. Pre-1962 coho counts were generally below 5,000 annually, but since then they have increased to over 50,000 annually. Chum salmon have declined from upwards of 2,000 adults annually during the period 1938-54 to less than 100 annually. Pink salmon escapement above Bonneville has historically been insignificant (less than 100 adults) and continues to fluctuate at such low levels today.

Prior to the construction of McNary and Ice Harbor Dams a comparison of adult counts at Bonneville and Rock Island Dams indicated the portion of the Lower River run destined for the Snake River and mid/upper Columbia River systems. After completion of Ice Harbor Dam in 1962 a more exact determination of the escapement of Snake River versus mid-Columbia stocks could be made by subtraction of Ice Harbor counts from McNary counts. Comparisons of McNary-Ice Harbor counts indicate that a general increasing percentage of fish passing McNary are destined for the mid-Columbia.

HYDROELECTRIC DEVELOPMENT IMPACTS

Migration Issues

The simultaneous presence of adult and juvenile salmonids in the river complicates the issue of appropriate instream flows for the Columbia River. The optimum flow requirements for these adult and juvenile fish are not the same.

Adult salmon are migrating upstream beginning in the early spring (March), with one or more stocks migrating up the mainstem Columbia and Snake Rivers throughout the spring and summer and into November. Upstream passage of adult salmonids can be severely impeded by high flows which decrease the efficiency of upstream fish passage facilities.

Downstream migrating juvenile salmonids are present throughout most of the adult migration period. The majority of the downstream migrants are smolts that are present in the mainstem river between mid-April and early June. Some smolts may be present, however, as early as the first of April and continuing into late June or July.

The active downstream migrations of these smolts may be enhanced by high flows. The migration rate of these smolts has been shown to be related to the rate of river flow. Fall chinook fry begin emerging from the spawning gravel in March (such as in the Hanford Reach). Little knowledge exists about the effects flows have on newly emerged fry present in areas such as the Hanford Reach. Rearing zero age class juvenile salmon and some smaller smolts continue to be present in the mainstem river through August. Little is known of the requirements of these fish, but nothing indicates that their survival would be enhanced by high flows.

These fish passage considerations indicate that the regulation of flows to enhance migration is a complex and incompletely understood management tool. Additional research on the flow requirements of both adult and juvenile salmonids is essential. Assigning flow regulations for lengthy periods of each year may be arbitrary and the total fisheries resource will not benefit.

In addition to flow regulation, mortalities of downstream migrating smolts is a significant problem. Large numbers of these spring migrants are lost due to turbine related mortalities, predation and other factors involved in passage through the impoundments. The turbine induced mortalities represent a significant problem that must be solved. Traveling screens installed at several of the Columbia and Snake River dams represent one approach to the solution of this problem. The effectiveness of traveling screens and associated collection/bypass facilities are being evaluated. The traveling screens do not represent the only or necessarily the best solution to turbine and impoundment related mortalities at all projects. Other systems for downstream migrant protection such as surface skimming, tributary collection and special spills are being evaluated to accomodate special site specific conditions.

Elimination of turbine induced mortalities alone will not solve all of the existing problems faced by smolts. Delayed migration, predation and other mortality problems associated with impoundments and flows can not be totally solved by reducing turbine mortalities. A comprehensive system-wide study of the potential for reducing the impact of these mortality factors on salmonid smolts is needed.

Historically, spring freshets of the unregulated river system provided relatively rapid transportation of smolts from rearing tributaries to the Columbia River estuary. Storage of the annual runoff in headwater areas of the river system and the subsequent regulation of river flows have altered this transportation mode. The regulated flows together with the impoundments along the migration route have increased the downstream migrant travel time 2 to 3 times greater than historic travel time. Higher flows during April and May could improve the existing migration rates provided that upstream storage is made

available for this purpose. During low water years, available water may not be adequate to provide higher fishery flows.

Minimum instream flows during the peak migration period appear to be necessary to provide the best migration rate practical through the impoundments. However, existing knowledge is inadequate to define the relationship of migration rates to specific flow rates for the impounded river. Flood control, navigation, power production, irrigation, physical constraints of the existing system, as well as fish and wildlife considerations may make it impractical to provide transportation flows of sufficient magnitude in all years to achieve the desired smolt migration rates through the impoundments. There is a need to define transportation flows balanced against the other requirements, but existing knowledge is inadequate to reliably establish the specific quantity and duration of these flows.

Existing Strategies and Research Needs

One strategy for dealing with smolt migration problems is to provide projects with collection, transportation or by-pass systems. Several systems are currently being tested in the Columbia River Basin and have provided some fishery benefits. Benefits to date from these efforts have been greater for steelhead than for chinook salmon.

The ice-trash sluiceway at The Dalles Dam has been employed as a unique collection and by-pass system with some success. This surface skimming system has not been successful at other projects tested and cannot be applied at projects not having suitable physical features.

Spill has been employed as a method of bypass at a number of Columbia River dams but has not been adequately evaluated. Theoretically, spill should move salmonid smolts past the dams effectively without subjecting them to turbine induced mortality. Although spillway passage causes little mortality in most cases, it has not been proven to be an effective or economical means of moving smolts past the dams. Recent hydroacoustic studies at some dams have shown that only a small portion of the total number of downstream migrants pass with the spill. In these cases, spill would be an ineffective means of by-pass. Because of the adverse impact on power production, spill must be clearly demonstrated to be an effective means of deflecting fish away from turbines in order to be considered as a practical solution to smolt migration problems. Existing data indicate that effective and safe means of collection and by-pass for all species of juvenile salmonid smolts at all projects remains to be developed.

Artificial transportation of smolts is a strategy that is currently being applied in the Snake River and lower Columbia River. Artificial transportation deserves consideration for other areas because it offers the potential for eliminating both turbine and impoundment related mortalities and reduces conflicts between flow needs of adult and juvenile salmonids and between power needs and juvenile salmonids. Transportation of hatchery fish from the hatchery

to the estuary may be an efficient solution to the migration mortalities when the problems of imprinting and saltwater adaptation are solved for upstream stocks. Each upstream stock may have different requirements for imprinting, migration (transportation) rate and saltwater adaptation that must be determined to make this strategy an effective solution.

Wild juvenile salmonids may also be efficiently transported if collection from major tributaries can be accomplished. The problems of imprinting, loading densities, migration rate, and saltwater adapatation must also be addressed and solved for these fish.

Transportation may not offer a solution to the problem of zero-age salmonids which feed and grow as they move gradually toward the estuary over a period of many months. The existing knowledge of zero age fish is inadequate to propose a solution at this time.

Supplemental Production

It is likely that the salmonid populations of the Columbia River system cannot be completely protected from the impacts of dams and their impoundments. Therefore, artificial production must be considered. There are several basic strategies available for such artificial production. These strategies are replacement "in-kind-in-place" versus the production of ocean harvested stocks at the most strategic locations.

The "in-kind-in-place" production strategy is based on the fact that salmon and steelhead in the Columbia River system are segregated into races which are naturally produced in the tributaries of eastern Washington, Idaho and eastern Oregon. Each of these races has adapted to its natal stream thereby developing a more or less unique set of genetic characteristics.

The advantages of "in-kind-in-place" management strategy are several: (1) The biological integrity (gene pool) of the upriver races can be preserved with appropriate management. This can be important from the standpoint of future fish management and survival. (2) The upriver fisheries can be preserved. (3) Natural production areas can continue to be used as nursery areas without total or greater reliance on artificial propagation. It should be noted that the mid-Columbia River races of salmonids still are present in adequate numbers to rebuild these populations to former production levels.

The "in-kind-in-place" management process also has certain disadvantages; principally the conflict for water use between anadromous fish destined pri marily for ocean harvest and electric generation needs. "In-kind-in-place" management requires that the fish be provided acceptable migration conditions for both upstream and downstream migrants. This includes effective devices to assure safe passage at dams for both adults and juveniles and adequate flows to transport them to and from the natal stream. It may be impractical to attempt "in-kind-in-place" management of upper-basin fish intended for ocean or lower river sport or commercial harvest.

The principal advantage of the strategic location of production facilities, namely, confining the salmon and steelhead nursery area to the Columbia River and tributaries below Bonneville Dam, is obvious. It precludes 1) the need for special instream flows for fish upstream of Bonneville which conflict with electric power needs, and 2) further development and expansion of fish passage facilities on the Columbia and Snake Rivers. The strategic location of production facilities should affect the ocean fishery as would "in-kind-in-place" production; however, it would not benefit the upstream fishery. It follows also that the other advantages of "in-kind-in-place" management would not be gained by the strategic location of supplemental production facilities.

While some utilities might prefer the strategic location concept, there is also support for the "in-kind-in-place" management concept. But, as noted above, the electric utility industry finds that a major conflict on certain flow years between fish and power needs can occur, and that the sacrifice of power or fish can be significant. The question is how can the two needs be best met without major costly sacrifice to either?

One potential solution is to increase storage in the upper watershed and earmark this storage for anadromous fish use. This would reduce the conflict between power and fish needs and could benefit the electric utility industry. Another solution is to provide artificial transportation (barge, truck, rail, etc.) for the downstream migrants. The fisheries agencies and the Corp of Engineers have investigated and implemented this option during a number of recent years. However, as mentioned earlier, there are certain problems associated with this potential solution and further research is necessary.

RESIDENT FISH AND WILDLIFE

Impacts on resident species resulting from hydroelectric development of the Columbia River system have been numerous and diverse including both positive and negative impacts. Commonly, the areas of greatest negative impact to resident species caused by hydroelectric development are the direct effects of inundation and the continuing operational effects of reservoir fluctuation. Of these two major impact areas, inundation losses can, in most cases, be directly mitigated or compensated. However, impacts resulting from flow and reservoir fluctuations are a difficult area to mitigate because of systemwide operation effects. This impact area poses the greatest potential for conflict in development of the fish and wildlife plan under Section 4(h).

For example, system operations which provide high volume flows to benefit the downstream migration of anadromous salmonids can be detrimental to resident species and their habitats. High flows may disrupt primary productivity, spawning and denning areas, and shoreline riparian habitats. Of course, hydroelectric development may also have beneficial effects or trade-offs for resident species, which must be considered. Examples of beneficial effects include lentic (slow-moving) waters of an impoundment which can provide nesting, rearing and staging habitat for aquatic mammals and waterfowl and certain shorebird species. In some areas of the Columbia River Basin, significant warm water fisheries (e.g. bass, crappie, walleye) have been established in hydroelectric reservoirs. Selective or deep water level discharge at some dams has enhanced downstream cold water fisheries (e.g. Libby Dam). Long-term water retention allows development of abundant plankton food sources in some reservoirs; storage water can also moderate flow conditions by reducing damage of flood flows and augmenting low flows to the benefit of resident species. Often a water development project has a concommitant increase in prey species which benefit some raptors. Of course, these are generalized areas of benefit. Each individual project will determine the degree of benefit for a species.

The severity of negative impacts to resident species will also be determined by characteristics of the individual project. Unfortunately, resident species have received varying degrees of recognition within the Columbia Basin. Adequate data bases exist for some species in some areas of the basin. For example, a reasonably good data base exists for ongoing fish planting programs (trout) connected with mitigation agreements and state management programs. On the other hand the biological and harvest data base for warm water fish is generally insufficient to make management decisions. A much more comprehensive data base exists for wildlife populations via harvest and hunter success rates. Pre- and post-inundation studies have resulted in site specific information for some projects. This base of supportive information is prerequisite to establishing compensation requirements which must be agreed to prior to implementing mitigation measures.

All hydroelectric projects have responsibilities stipulated in the FERC license or have Congressional mandates to conserve, protect, and perpetuate the

fish and wildlife resources. These responsibilities often require mitigation for impacts to these resources. Mitigation measures have included numerous fish hatcheries or spawning channels, acquiring public shoreline access, developing boat launches, planting game birds, and purchasing and improving wildlife habitat.

Resident species are most suited to project-by-project and species-by-species management. Unfortunately, a complete resident species data base for the Columbia River Basin is lacking. Such information will be required to establish compensation needs and determine appropriate mitigative measures to be implemented under the plan. Moreover, coordination between resource management agencies, particularly for resident species, is minimal. This latter concern is of particular importance in consideration of existing and future river system operations and the potential conflicts such operations pose for various river uses. The considerations presented in this document will address these concerns.

CONSIDERATIONS

In this report the Committee has expressed concern for both the fish and wildlife resources and the power resources of the Columbia Basin. The Committee has chosen the title "Considerations" rather than "Recommendations" to distinguish our ideas from those required statutorily by others. As the 4(h) program planning process continues, the Committee intends to provide detailed information to assist the Council in meeting its responsibilities.

While the two areas of concern are often thought of as in conflict, the Committee believes that the vast resource of the Columbia Basin can be developed and utilized for the benefit of both. In this section, the Committee presents elements, suggestions, and concepts which could lead to the reconciliation of these potentially conflicting viewpoints.

NEED SYSTEMWIDE APPROACH FOR FISH AND WILDLIFE

As provided in the Act, anadromous fish, resident fish and wildlife management programs for the Columbia River and tributaries should be developed and implemented on a regional, systemwide basis. This fundamental concept for a successful program requires coordination and cooperation among numerous federal and state fish and wildlife agencies, the Indian tribes and the power producers. Many past and present fishery actions were developed on a "piecemeal" or site specific approach and ignored systemwide concerns or have been found to be inconsistent or in conflict with fisheries actions taken elsewhere in the system. A systems impact analysis group with computer modeling capabilities is needed to produce river operational plans which balance the needs of all river uses. The power planning and operation system devised and used by the the power producers is viewed as a possible model or prototype of the regional process needed. The present Committee on Fisheries Operations (COFO) organization could be modified and used as a cornerstone for developing the thrust of this recommendation concerning an operating program for fish and wildlife.

ESTABLISH FISH AND WILDLIFE GOALS AND OBJECTIVES

A major element essential for developing the Section 4(h) program will be the establishment of appropriate goals and objectives. Definitive statements are needed on such things as overall production, survival, harvest and escapement for each species and stock of anadromous fish within the Columbia River Basin. The same is true for the resident fish and wildlife species. Without overall resource management goals, it will be difficult to effectively evaluate potential program recommendations intended to protect, mitigate and enhance fish and wildlife resources within the river basin. Terms frequently used such as "improve", "optimize", "maximize" and "minimize" lack specific meaning without the reference of goals and objectives. These terms imply a "blank check" approach

to power rate payers and disregard other impacts and constraints not only on power producers but on fish and wildlife management.

CONSIDER EXISTING FISH AND WILDLIFE PLANNING PROGRAMS

The Council should give serious consideration to existing fish protection efforts under other authorities, prior to developing the Section 4(h) program for fish and wildlife resources in the Columbia River Basin and tributaries. For example the mid-Columbia Projects are currently being evaluated under the authority of the FERC to protect, mitigate, and enhance the fish and wildlife resources in an on-going five year study. As another example, the Idaho Power Company is evaluating fish and wildlife programs for several projects in cooperation with the management agencies and FERC. The Corps of Engineers has reported recently to the Council on its authority and efforts to mitigate the effects of its hydroelectric projects.

RECOGNIZE MULTIPLE USES OF COLUMBIA RIVER

The Council should recognize the multiple-use nature of the Columbia River and its tributaries in developing the fish and wildlife program. In addition to power production, water resource development purposes include flood control, irrigation, navigation, municipal and industrial water supply, and recreation. Thus taxpayers throughout the Nation as well as citizens in the Pacific Northwest (the electric ratepayers) benefit from the existing resource development projects in the Columbia River basin. The burden for protection, mitigation and enhancement of affected fish and wildlife resources must be borne by others as well.

SHARE THE SHORTAGE

Consideration of possible flow requirements to enhance juvenile downstream migration must recognize the historic, natural variability of river system flows. Periods of drought have been encountered in the past and will undoubtedly reoccur. The fishery resource adjusted to these events in the past, prior to water resource development. The power production system must adjust also during low flow periods in order to meet electric load demand. To avoid critical power shortages during such times with potentially devastating consequences to the region, the fishery resource must share the water shortage with power producers. The specifics or mechanics of developing and implementing this concept should be addressed in cooperation with the fish and wildlife agencies and Indian tribes during development of the Section 4(h) program.

CONSIDER ALTERNATIVE FISH SURVIVAL STRATEGIES

The Council should recognize that the individual hydroelectric projects may require different fish survival strategies. Each project has differing

physical characteristics and obviously has a different impact on the fishery resource due to its physical location within the river system. The application of devices or methods uniformly throughout the system may not achieve intended results depending on the circumstances. The biological desirability of methods or strategies intended to improve survival must take into account the available evidence indicating likelihood of achieving satisfactory results both ecologically and economically. In the development of its Section 4(h) program, the Council should consider the unique characteristics of each project in development of fish survival strategies.

CONSIDER ANADROMOUS FISH HARVEST MANAGEMENT

The Council should consider the effect of harvest management on the fish runs to the Columbia River. This increased salmon harvest along the Pacific Coast has had a substantial impact on the salmon stocks of the Columbia River. Recently, there has been increasing focus on the hydroelectric power projects as both the cause of and the potential cure for the current condition of the Columbia River anadromous fish resource. The power producers and the rate payers are conceivably being asked to restore the anadromous fish resources to former levels of production. Restoration of the Columbia River fish resources must include improved management of ocean harvest.

DEVELOP PROCESS FOR PROGRAM PLANNING

The Council should identify as soon as practicable the process it envisages to use in meeting its Section 4(h)(1)(A) responsibilities. Considering the anadromous fish legacy that the Council inherits and the Congressional intent that the Council not become a "super fish agency", the program planning process will be critical in determining the product required and producing it in a timely fashion. The Committee feels strongly that extensive analyses must be conducted regarding data adequacy, cost-effectiveness, and biological efficiency. The Council may be faced with choosing among conflicting "facts", "figures", "opinions", and "testimony" in a politically charged atmosphere in adopting program recommendations. The Committee recommends that an effective fact-finding and deliberative process be developed and adopted. This may involve the use of a hearing examiner or some other procedure for taking testimony from interested parties including the general public.

INVESTIGATE POTENTIAL DEDICATED STORAGE

The Council should consider the potential of developing additional upstream water storage as a device for providing flow augmentation for juvenile fish downstream migration.

INVESTIGATE ARTIFICIAL TRANSPORTATION

The strategy of artificially transporting (barge, truck, etc.) downstream migrants has been investigated by the Corps of Engineers in recent years with some encouraging results. The problems of imprinting and saltwater adaptation remain to be solved for many fish stocks, however, futher research could make this strategy a desirable option. The Committee recommends that the Council strongly support the additional reseach necessary to fully evaluate this option for implementation.

PROJECT-BY-PROJECT/SPECIES-BY-SPECIES APPROACH FOR RESIDENT FISH AND WILDLIFE

Within the context of the first two considerations, the nature of resident fish and wildlife at Columbia River Basin hydroelectric projects suggests that a project-by-project and species-by-species approach may be the most biologically desirable. The variation in environmental conditions that exists at individual projects results in a diversity of species within and between projects. This diversity requires specialized resident species management strategies designed specifically for each project.

The first step in developing a resident species management plan is to assess the existing data base for each project. The assessment procedure directs appropriate research, identifies the extent of beneficial and detrimental effects, and leads to appropriate management measures. This procedure was used to some degree in the development of the "Montana recommendations for fish and wildlife program" document. The Committee recommends that the Council consider this approach for the resident fish and wildlife elements of the program.

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U.S. DEPARTMENT OF ENERGY - BONNEVILLE POWER ADMINISTRATION

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Bonneville Power Administration
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OFFICE OF THE ADMINISTRATOR

In reply refer to PBG

NOV 18 1981

Mr. Daniel J. Evans
Chairman, Northwest Power
Planning Council
The Evergreen State College
Olympia, Washington 98504

Dear Dan:

On June 10, 1981, the Pacific Northwest Electric Power and Conservation Planning Council called for fish and wildlife recommendations from the Federal and region's fish and wildlife agencies, Indian Tribes, and others by November 15, 1981. The Bonneville Power Administration (BPA) has been watching closely and, where appropriate, assisting the agencies and Tribes in the development of those recommendations. Our fish and wildlife staff have been in close contact with the State and Federal fish and wildlife agencies, the Tribes, and the Pacific Northwest Utilities Conference Committee's Fish and Wildlife Subcommittee, all of which intend to submit materials to the Council.

After careful consideration, BPA determined that our best role in this effort would be to facilitate, in whatever way we might, the development of agency and Tribal recommendations while continuing our ongoing fish and wildlife activities. We believe that the development of comprehensive fish and wildlife recommendations go beyond BPA's responsibility and are more properly left to those charged with the management of fish and wildlife resources.

Having much experience with hydroelectric operations and several years of direct involvement with anadromous fishery matters, we think it is appropriate for BPA to inform the Council of some important issues and considerations from our perspective. Additionally, we think it timely to provide the Council with an update of our fish and wildlife activities under the Regional Act. The enclosed document is offered for your information and consideration during this initial phase of fish and wildlife program development.

We believe that the development and implementation of a fish and wildlife program will be a dynamic process. It is unlikely that all problems can be identified and resolved, and a course for implementation set during the next year or even the next several years. Priority concerns, however, can be identified and a course of action planned that will lead to more precise problem definition, alternative solutions, and resolution. We continue to believe, as with other programs envisioned under the Regional Act, that the quality of the fish and wildlife program is as important or more important as than the speed with which it is implemented.

Bonneville will continue to be active in the review and further development of the fish and wildlife program during the next year. In addition to providing input to the Council, we will make staff available to supply the Council with requested information or analyses that are needed to assist in the consideration of these important fish and wildlife/energy matters.

Sincerely,

Peter T. Johnson

Administrator

Enclosure

cc:
Pacific Northwest Electric Power and
Conservation Planning Council Members
Executive Director, Ed Sheets, PNWEPCPC
U.S. Congressman John Dingell
U.S. Congressman Richard Ottinger
Columbia River Fisheries Council
Corps of Engineers, PNW
Bureau of Reclamation
Pacific Northwest Utilities Conference Committee
Bureau of Land Management
U.S. Forest Service, Region 6
National Marine Fisheries Service
U.S. Fish and Wildlife Service
Columbia River Inter-Tribal Fish Commission
Bureau of Indian Affairs
Oregon Department of Fish and Wildlife
Idaho Department of Fish and Game
Washington Department of Fisheries
Washington Department of Game
Montana Department of Fish, Wildlife, and Game

STATUS REPORT AND RECOMMENDATIONS REGARDING DEVELOPMENT OF THE FISH AND WILDLIFE PROGRAM

Submitted To

The Pacific Northwest Electric
Power and Conservation Planning Council

By

The Bonneville Power Administration

November 15, 1981

OUTLINE

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OVERVIEW

The Pacific Northwest Electric Power Planning and Conservation Act (Regional Act) has levied a new area of responsibility on Bonneville Power Administration (BPA). As provided in Section 4(h)(10)(A) of the Regional Act, "The Administrator shall use the Bonneville Power Administration fund . . . to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries . . . ." The extent to which and the ways in which the Administrator carries out this obligation will be directly related to the Pacific Northwest Electric Power and Conservation Planning Council's (Regional Council) Fish and Wildlife Program.

BPA has closely followed the efforts of the various fish and wildlife agencies, Indian Tribes, and utilities to develop fish and wildlife recommendations. BPA has assisted these various groups in the development of such recommendations, both in terms of staff assistance and funding support. BPA believes that Congress intended that these recommendations be developed primarily by those agencies and Indian Tribes responsible for the management of the fish and wildlife resource.

As an agency charged with implementing the Regional Council's Fish and Wildlife Program, BPA cannot be indifferent about how the program is developed or what constitutes its major features. BPA also believes that its experience in the planning and operation of the hydroelectric generating system since the enactment of the Bonneville Project Act in 1937, should be valuable in providing significant insight in some areas on how the Regional Act's fish and wildlife mandate can best be accomplished. Therefore, BPA presents the following discussion to the Regional Council for consideration when developing the Fish and Wildlife Program.

Presented here are: (1) a synopsis of some of the more important fish and wildlife activities engaged in by BPA since the passage of the Regional Act; and (2) a discussion of significant issues BPA believes should be considered in development of the Fish and Wildlife Program Program. Several recommendations are also provided which BPA feels will assist the achievement of the fish and wildlife objectives of the Regional Act. A summary of these issues and recommendations is presented beginning on page 12.

STATUS

The following section presents a synopsis from BPA's perspective of some of the more important activities undertaken since the passage of the Regional Act and their current status. It does not include the myriad of coordinating activities and substantial day-to-day involvement which BPA has with committees, fish and wildlife agencies, Tribes, researchers, and all parties interested in the protection, mitigation, and enhancement of Columbia River Basin fish and wildlife resources.

Status of BPA Fish and Wildlife Funding Activities

Since enactment of Pub. L. 96-501, BPA has taken a number of actions to expand its fish and wildlife research and development program. BPA's initial activity was the development of a supplemental budget proposal for FY 81 and a revised proposal for FY 82. BPA's ongoing fishery restoration program, initiated in FY 78, had gradually increased to approximately $1.5 million in FY 81; an amount which was deemed inadequate in view of BPA's greatly expanded fish and wildlife obligation. The supplemental budget request of an additional $1.44 million was approved in the spring of 1981, raising the total amount available for BPA-funded research and development in FY 81 to $2.94 million.

With increased funds available, BPA began looking at the many proposals that had been received after passage of the Regional Act. Among those was a package of eight proposals submitted by the Columbia River Fisheries Council; numerous proposals from the region's universities; proposals from Treaty Indian Tribes; and proposals submitted independently by Federal and state fish and wildlife agencies. The result of this increased interest culminated in 17 signed contracts for projects and activities to be conducted in both FY 81 and 82, and represented a commitment of over $2.26 million in BPA ratepayer funds (see Table 1). While the vast majority of these projects deal with the Columbia River salmon and steelhead resource, BPA was able to initiate a resident fish (kokanee) study on the Flathead River System with the Montana Department of Fish, Wildlife, and Parks.

Of special significance in the FY 81 program, were several contracts written to assist the fish and wildlife agencies and Tribes in the preparation of their Section 4(h) fish and wildlife recommendations. These proposals came to BPA under the auspices of the Ad Hoc Executive Committee (Ad Hoc Committee). The Ad Hoc Committee developed in the late spring of 1981 in recognition of increased opportunity for fish and wildlife to receive "equitable treatment" under the Regional Act. The Ad Hoc Committee is composed of the two Federal fish and wildlife agencies, the fish and wildlife agencies from all four Northwest States and all twelve appropriate Indian Tribes. The Ad Hoc Committee was also formed with the intent of presenting recommendations to the Regional Council dealing with all fish and wildlife resources, not just anadromous fish.

Fiscal Year 1982 has continued as FY 81 ended with an increased interest in BPA fish and wildlife funds. To date, BPA has received over 40 proposals totaling in excess of $4.5 million, with only $3.95 million available within the programed budget. Included among these proposals are 28 submitted to BPA by the Columbia River Fisheries Council on September 30, 1981. Significantly, BPA has received proposals from a far greater range of potential researchers in FY 82 than ever before (in prior years, most funds went to the National Marine Fisheries Service).

The Regional Act does not require coordination among those groups who submit proposals to BPA. As a result, reviewing and coordinating a large number of proposals to assure that there is little or no duplication is a time-consuming endeavor. However, BPA has initiated this review and anticipates an early decision on the majority of the proposals we have received as of this date.

Funding Criteria and Guidelines

There are many "players" involved in fish and wildlife protection, mitigation, and enhancement activities on the Columbia River System, each operating within specific authorities and following established guidelines and funding criteria. BPA has been directed by Congress in Section 4(h)(10)(A) of the Regional Act that money from the Bonneville fund is to be expended "in addition to, not in lieu of" other agencies responsibilities. BPA needs to define a niche for its fish and wildlife activities and attendant expenditures.

BPA is currently refining criteria and guidelines for fish and wildlife projects funded under the authorities of the Regional Act. These criteria will identify areas of fish and wildlife involvement appropriate for funding consideration by the Administrator. The guidelines will assist potential contractors in the timely development of proposals consistent with Federal procurement regulations and budgetary processes.

These criteria and guidelines are being developed in a cooperative manner, since they must closely relate to those established by the other funding agencies. Discussions have been initiated with the Corps of Engineers and the Columbia River Fisheries Council (CRFC) for the purpose of developing the best criteria and guidelines possible at this time. BPA believes that the Regional Council's Fish and Wildlife Program will assist significantly in the future refinement of these criteria by identifying appropriate areas to which BPA should direct funding.

Fish and Wildlife Power Sales Contract Language

The fisheries community, acting primarily through the National Marine Fisheries Service (NMFS), recommended the inclusion of language in BPA's power sales and exchange contracts which affirmed the obligation of the Regional Act to protect, mitigate, and enhance fish and wildlife resources; established measures to accommodate these obligations; and assured that the contracts would not prevent or impair the implementation of such fish and wildlife measures.

The language was broadly supported by fishery agencies, Tribes, and the public in meetings held throughout the region. BPA determined that the specific language provided was not consistent with BPA's authority and constituted a supremacy clause with regard to other aspects of the contract. However, language was subsequently negotiated with BPA's customers and fish and wildlife interests which more appropriately addressed fish and wildlife concerns.

Fish and wildlife language is contained in Sections 6 and 16(d) of the offered contracts and in Section 44 of the General Contract Provisions. In general, these provisions affirm BPA's responsibility to protect, mitigate, and enhance fish and wildlife; prevent the use of the customers' contract obligations to BPA as a shield against meeting fish and wildlife needs; and allow future negotiation of amendments to permit the "plan" or fish and wildlife program to be effective.

Although some fisheries recommendations were not incorporated into the contracts because they were either inappropriate, inferred responsibilities beyond BPA's authority, or introduced uncertainty regarding fulfillment of other contract provisions, BPA believes the changes that were accommodated will provide the means to insure implementation of the Regional Council's Fish and Wildlife Program without imposing obligations outside BPA's authority on the region's utilities.

Resource Acquisition - Environmental Cost Methodology

On October 9, 1981, BPA issued a "Notice of Proposed Methodology for Determining the Environmental Costs and Benefits." Public meetings were held in Portland, Seattle, Boise, and Missoula to receive comments on the methodology. Concerns were raised that BPA insure the Section 4(e)(2) mandate (to give due consideration to fish and wildlife needs in conservation and resource acquisition activities) of the Regional Act is carried out. As currently proposed, the methodology is a procedural approach to environmental costs and benefits. As such, no specific quantitative techniques were included addressing fish and wildlife concerns. This decision was based in part on the advice of BPA's consultant (ECO Northwest, LTD.) that, "there is no readily available cookbook methodology for quantifying in dollars the costs and benefits of environmental impacts."

While a refined, easily applied methodology for quantifying all aspects of fish and wildlife costs and benefits associated with resource acquisitions is not presently available, BPA intends to work closely with interested parties to improve upon available techniques and approaches as part of the environmental cost and benefit methodology and to satisfy Section 4(e)(2). BPA fish and wildlife staff have been in contact with each state and Federal fish and wildlife agency to obtain input regarding their respective requirements and methodologies for evaluating and quantifying impacts, costs, and benefits associated with resource development. In addition, BPA contracted with the National Marine Fisheries Service to update and refine a 1975 report entitled "Partial Net Economic Values for Salmon and Steelhead for the Columbia River System." This report will provide an economic method which can be used to value salmon and steelhead populations produced within the Columbia River Basin. The final report is to be submitted to BPA by December 31, 1981. As this and other studies become available, BPA will be able to assure a more systematic accounting of the fisheries costs and benefits associated with resource acquisitions.

ISSUES AND RECOMMENDATIONS

The previous section discussed what BPA has done and is continuing to do in response to the fish and wildlife mandate of the Regional Act. The following section presents a discussion on issues that BPA perceives as important and which must be addressed in order to move toward achievement of the fish and wildlife objectives of the Regional Act. Where appropriate, BPA has made recommendations for the Regional Council's consideration. These recommendations reflect experience by BPA in funding research activities dealing with the anadromous fishery resource as well as its experience in hydroelectric system planning and operation.

Summary of Issues and Recommendations

A. System Approach

BPA recommends that the Fish and Wildlife Program be developed around a fish and wildlife management plan, which addresses the Columbia River and its tributaries as a system. This management plan should: (1) establish areas of immediate need; (2) recognize the conflict between competing uses of the water resource; (3) provide a logical approach to arresting downward trends in anadromous fish populations; and (4) be consistent with the requirement for an adequate, efficient, economical, and reliable power supply.

B. Fish Flows

BPA recommends that the Regional Council's Fish and Wildlife Program establish an approach to identify scientifically the range of flows desired under varying circumstances and costs and, if possible, to determine the relationship between improved flows and fish survival. Further, BPA endorses and supports the efforts of the Instream Flow Work Group to develop an approach to implement adequate flows for the protection, mitigation, and enhancement of anadromous fish. Finally, BPA recommends the Regional Council endorse the continuation of the Committee on Fisheries Operation, an interagency group that has been instrumental in planning annual fish flows to assist juvenile migrating salmon and steelhead.

C. Funding Issue

Section 4(h)(10)(A) of the Regional Act, which authorizes BPA to fund fish and wildlife activities, does not define the phrase ". . . to the extent affected by the development and operation of any hydroelectric project . . . ." Until the Regional Council's Fish and Wildlife Program is adopted, BPA has chosen to limit its funding obligation to those activities that bear a reasonably direct relationship to hydroelectric development and/or operations, and are within the confines of the Columbia River and its tributaries.

D. Coordination of Anadromous Fisheries Research and Development Projects

The use of the Columbia River Fisheries Council, or an expanded coordinating body, to bring a more directed and cohesive approach to solving regional salmon and steelhead problems is supported by BPA. BPA urges the Regional Council to consider what alternatives might be available to enhance, on a system basis, the region's capability to plan and coordinate research and development activities.

E. Balancing Fish and Wildlife and Energy Needs

Discussion between BPA and the fish and wildlife management agencies and Tribes, indicate that their fish and wildlife recommendations lean toward greater operation of the hydroelectric generating system for fish and

wildlife. BPA is concerned that the management agencies' position give adequate attention to the requirements for an "economical and reliable power supply" (Section 4(h)(5)). BPA is also concerned that the substantial annual expenditure (e.g., repayment of appropriated funds, power generation foregone, power revenues lost, and direct fish and wildlife expenditures) by BPA and its impact on BPA's ratepayers be recognized in the development of the Regional Council's Fish and Wildlife Program.

* * * *

THESE FIVE ISSUES -- SYSTEM APPROACH, FISH FLOWS, FUNDING, COORDINATION, AND BALANCING FISH AND WILDLIFE AND ENERGY NEEDS -- ARE EACH DISCUSSED MORE FULLY IN THE FOLLOWING TEXT.

System Approach

On October 31, 1980, BPA solicited the input of the region's fish and wildlife interests on how BPA might proceed in implementing the Regional Act's fish and wildlife mandate. Consistently, the comments received suggested that BPA's fish and wildlife activities address the system as a whole, rather than as individual pieces (e.g., the Mid-Columbia, Lower Columbia, Snake River, other tributaries, or major storage reservoirs). These comments suggested, and BPA's experience supports the view, that historically fish and wildlife research activities have not been guided by an overall program (including goals and objectives) aimed at restoring the Columbia River Basin's fish and wildlife resources.

In 1981, the CRFC attempted to develop and adopt a "Comprehensive Plan for Production and Management of Columbia River Basin Anadromous Salmon and Steelhead." This would have been the first systemwide management plan for anadromous fish. Unfortunately, the CRFC was not able to adopt this plan, but instead was only able to develop a management framework (Columbia River Basin Salmon and Steelhead Management Framework, CRFC, March 1981). While the CRFC has attempted to establish a management plan for anadromous fish, BPA is unaware of any management plan for wildlife and resident fish.

In recent years, the competition for the water of the Columbia River has been most intense between hydroelectric power generation and the needs of anadromous fish. Similar conflicts between power and resident fish and wildlife have emerged, as well as conflicts between resident fish and wildlife and anadromous fish. For example, enhancing (increasing) river flows in the spring to assist juvenile migrating salmon and steelhead results in greater draft of storage reservoirs, often adversely impacting resident fish populations. Without an overall plan for approaching fish and wildlife needs, these types of conflicts are likely to increase.

A more visible need for an overall management plan is demonstrated by the annual competition between ocean harvest and river harvest of salmon, and ocean harvest versus spawning escapement. While BPA acknowledges the complexity of this issue, the economics of providing expensive fish passage facilities, hatcheries, or other fish and wildlife measures has been of great concern as user groups wage a battle for the "last fish."

The development of the Columbia River System for flood control, irrigation, navigation, and hydroelectric generation has necessitated a highly coordinated system operation between operating agencies, public and private utilities, states, and between the U.S. and Canada. Protection and enhancement of anadromous fish and other fish and wildlife requires a nearly equivalent level of system coordination. Such an approach on the part of the fisheries community will likely be prerequisite to the successful integration of these important uses of the Columbia River resource.

BPA suggests that the Regional Council look closely at the fish and wildlife agencies' recommendations as they relate to this issue. The development of a management plan to address the system as a whole is vital. Such a plan should

establish goals and objectives that guide the Fish and Wildlife Program adopted by the Regional Council. BPA believes that the management plan should identify key areas needing immediate attention as well as those which can potentially arrest or reverse the downward trends in anadromous fish populations. Such a plan should also recognize the conflicts between anadromous fish and other fish and wildlife, and provide for an adequate, efficient, economical, and reliable power supply.

Fish Flows

In recent years the single most visible activity instituted for the protection of anadromous fish, has been "Operation Fish Flow." This cooperative effort between Federal water managers, generating utilities, fisheries management agencies, and Treaty Indian Tribes, has served to protect juvenile salmon and steelhead migrating downstream since the drought year of 1977. This has been accomplished through close monitoring of the migration's progress coupled with the provision of spills and additional flows when appropriate.

Another important feature of "Operation Fish Flow" has been the concurrent use (development and operation) of juvenile collection/bypass facilities at Corps hydroelectric facilities, coupled with the transportation of these juveniles around mainstem dams. BPA views the collection/transportation program as an alternative to spill and flows, which from an energy perspective, has significant potential to reduce the need for special fishery operations that affect hydroelectric generating potential. BPA believes this program should be included in any portion of the Regional Council's Fish and Wildlife Program dealing with special operations to protect migrating juvenile salmon and steelhead.

While spills for fish may be looked on as interim measures, it is likely that the requirement for special flows to enhance the migration of juvenile salmonids will continue indefinitely. BPA believes existing data are insufficient to support the total implementation of those flows currently recommended by the CRFC. However, BPA, the Corps of Engineers, and the Bureau of Reclamation, have worked together to assist the cooperative efforts to provide additional flow for fish at some expense, both in terms of energy production foregone and risk to the power system (jeopardizing reservoir refill capability).

BPA believes there are two questions of significance regarding fish flows. First, is there sufficient scientific study and data development to identify what range of flows are desireable under various circumstances; and, second, how can these flows be implemented in a manner consistent with the other purposes of the Act. The identification of fish flows which: (1) adequately assist juvenile salmon and steelhead; (2) recognize the competing use of the Columbia River water resource; and (3) provide for an adequate, efficient, economical, and reliable power supply, has yet to be addressed. Rather than specific minimum or optimum fish flows, BPA recommends that the Regional Council develop as a part of its Fish and Wildlife Program an approach to identify what flows will produce the desired results. BPA further recognizes that in the interim, the Federal Columbia River Power System (FCRPS) will be operated at some power loss, risk to the power system, and economic loss.

BPA believes the second of these two questions is currently being addressed through the efforts of the Instream Flow Work Group. BPA has supported this group's efforts since its inception, through the dedication of staff and computer time to the work group's activities. In addition, on August 14, 1981, BPA agreed to fund the National Marine Fisheries Service (NMFS) to develop fishery flow recommendations which could be included in Columbia Basin annual operating programs. A key activity under this task will be the evaluation of potential impacts of fishery flows on the FCRPS. The NMFS is working closely with BPA and the Instream Flow Work Group, and will be providing a preliminary report to the Regional Council in their November 15, 1981, fish and wildlife recommendations. BPA cautions the Regional Council that this preliminary report may not reflect the coordinated views of BPA, NMFS, and the Instream Flow Work Group. The final report, which will be the result of the joint efforts of all the cooperating parties, by contractual agreement with NMFS will not be available until December 31, 1981.

Through the activities of the Columbia River Water Management Group's, Committee on Fisheries Operations (COFO), fishery flows have been recognized and planned for since 1977. In 1980, the COFO developed its first "Implementation Plan" for special fish operations. In 1981, the "Implementation Plan" was expanded to include a "Detailed Fisheries Operating Plan," which identified and established procedures for the implementation of specific operations to assist juvenile and adult salmon and steelhead throughout the migration season. This group has already met to address the "1982 Implementation Plan" and has scheduled meetings in February to discuss the "1982 Detailed Fisheries Operating Plan." BPA recommends that the Regional Council endorse continuation of the Committee on Fisheries Operation as the appropriate forum for interagency planning and discussion of fish flows.

The provision of flows must be closely tied to annual water run-off forecasts. Special fishery operations, by their nature, necessitate a cooperative effort that must be coordinated in order to succeed. The COFO has provided a successful forum for addressing both the needs of the salmon and steelhead resource and the ability of the power system to support such fishery needs. The Regional Council's acknowledgement and support of the COFO would serve to increase COFO's effectiveness in this effort.

Funding Issue

Table 2 presents a listing of all research projects funded by BPA since FY 78. While these projects add some level of knowledge to efforts to restore anadromous fish to the Columbia River Basin, their relationship to hydroelectric development and operation is occasionally difficult to identify. Table 3 lists those proposals submitted to BPA by the CRFC on September 30, 1981, for funding consideration in FY 82. Again, while each project may indirectly be related to hydroelectric development and operation, a direct relationship may not exist or is not apparent.

Section 4(h)(10)(A) of the Regional Act, which authorizes BPA to fund fish and wildlife activities, does not define the phrase, ". . . to the extent affected by development and operation of any hydroelectric project of the Columbia River and its tributaries . . . ." One interpretation would suggest that BPA fund those fish and wildlife protection, mitigation, or enhancement activities with any demonstrable relationship to hydroelectric development and operation. A stricter reading would suggest that only those activities directly related to hydroelectric development and operation would be appropriate. Further, as may be seen in some of the proposals in Table 3, the location of research activities can be expanded significantly beyond the confines of the Columbia River and tributaries depending on how their relationship to hydroelectric development and operation is viewed. Finally, the funding authority does not address the respective responsibilies of the various operating and management agencies to support certain fish and wildlife activities, either ongoing or new.

BPA believes the Regional Act limits fish and wildlife obligations of the Administrator to those activities that bear a reasonably direct relationship to hydroelectric development and/or operations, and are within the confines of the Columbia River and its tributaries. BPA desires to remain flexible when addressing the funding of fish and wildlife activities, but budgetary limitations will necessitate some prioritization between projects. Ultimately, the responsibility for determining the appropriateness of expenditures from the Bonneville fund rests with the Administrator.

Until the Regional Council's Fish and Wildlife Program is adopted, BPA will continue its present interpretation of its funding responsibilities. BPA believes this is an appropriate approach based on the requirement of Section 4(h)(10)(A) that BPA funding be "in addition to, not in lieu of." This issue and BPA's current approach have already proven to be controversial. BPA urges the careful assessment of this funding issue by the Regional Council when considering recommendations of the fish and wildlife management agencies.

Coordination of Anadromous Fisheries Research and Development Projects

Under a 1978 Interagency Agreement between BPA and the Corps of Engineers (North Pacific Division), research and development projects are jointly reviewed to insure that duplication of efforts between the agencies does not occur and that, to the extent practicable, activities of the two agencies are complementary. However, with the entrance by BPA as an additional major funding source for fish and wildlife research and development activities and the attendant increase in the number of projects submitted, it will become increasingly important to carefully coordinate research and development projects to realize the maximum benefit from available funds.

There are at least 17 separate entities (Table 4) with biological staff that conduct anadromous fish research and development activities on the Columbia River and its tributaries. Because of the multiplicity of participants, BPA perceives a need for improved communication and project management capability, not only among agencies, but within them as well.

The Columbia River Fisheries Council (CRFC) presently serves as the coordinating entity for research and development projects involving anadromous fish. Under BPA's existing anadromous fishery restoration program, the CRFC was the sole source of research proposals submitted to BPA for funding consideration. While maintaining the final funding authority for the anadromous fishery program, BPA has relied upon the technical expertise of the CRFC and its member agencies and Tribes, for the identification of anadromous fishery research needs. Key CRFC committees in this process have been the Steering Committee and the Columbia Basin Fisheries Technical Committee. With the passage of the Regional Act, the CRFC formed a new committee, the Fisheries Research, Enhancement, and Development Subcommittee (FREDS). The FREDS was created for the sole purpose of establishing anadromous fisheries needs and soliciting and directing research and development activities to address these needs. Recently, BPA was invited by the CRFC to become more involved in the activities of these committees.

The CRFC as presently constituted provides for participation by 10 of the 17 agencies, Tribes and operating entities listed in Table 4. However, continued participation by the four Confederated Tribes appears at this time to be in serious jeopardy, thus reducing effective participation to six members.

BPA views the CRFC or, alternatively, an expanded coordinating body, as necessary to bring a more directed and cohesive approach to solving regional salmon and steelhead problems. However, an overriding obstacle to the effectiveness of the CRFC, has been the ad hoc nature of its existence. While member agencies and Tribes can participate in committee and subcommittee meetings, their other responsibilities preclude the dedication of adequate staff time to the development of plans, objectives, and goals for the committees' activities (CRFC management framework is such an example). This situation has been further aggravated by recent budget cuts (both state and Federal) and static or reduced staff ceilings.

Over the next decade BPA and the other operating agencies will likely commit in excess of $100 million to the protection, mitigation, and enhancement of the Columbia River's salmon and steelhead resources. In order to produce meaningful results from these expenditures and maximize benefits, system planning and coordination among the fishery management agencies and Tribes needs to be improved. Fishery managers and the Tribes must dedicate staff to this effort at a level commensurate with the funding commitments of BPA and the other operating entities. BPA urges the Regional Council, in developing its program, to consider what alternatives might be available to achieve these results.

Balancing Fish and Wildlife and Energy Needs

The Section 4(h) Fish and Wildlife Program must concurrently meet the fish and wildlife objectives of the Regional Act while assuring "the Pacific Northwest an adequate, efficient, economical, and reliable power supply," (Section 4(h)(5)). Discussions between BPA and fish and wildlife management agencies and Indian Tribes, indicate that their fish and wildlife recommendations lean toward greater operation of the hydroelectric generating system for fish and wildlife.

The fisheries community recommendations suggest that there is unlimited opportunity for activities to accomplish adopted objectives for the Columbia River Basin's fish and wildlife resources. These activities might include mitigative measures for past hydroelectric development, as well as current development and operations; enchancement activities, some of which have not even been identified; and significant alterations in the operation of the hydroelectric generating system for fish and wildlife. BPA is concerned that tne management agencies give adequate attention to the requirement for an "economical and reliable power supply."

BPA has repaid to the Federal Treasury almost $200 million for Federal fish and wildlife capital facilities built in conjunction with Federal hydroelectric projects. Annual reimbursements are approaching $20 million, not including power generation foregone, power revenue losses and charges as a result of special fish flow operations, and direct fish and wildlife program expenditures.

The Regional Council must be cognizant of these costs when developing its fish and wildlife program. The question of what is the appropriate amount for the region's consumers of electric power to pay for fish and wildlife protection, mitigation, and enhancement must be addressed. A balancing between fish and wildlife and the region's power supply must be established and, from BPA's viewpoint, the Regional Council's Fish and Wildlife Program is the appropriate mechanism to achieve this balance.

FY 1981 FISH AND WILDLIFE PROGRAM

TITLE OF EFFORT:	CONTRACTING ENTITY:	FUNDS:
IMPRINTING OF HATCHERY-REARED SALMON AND STEELHEAD TROUT FOR HOMING OF TRANSPORTED FISH	NATIONAL MARINE FISHERIES SERVICE	96,000
GENETIC IDENTIFICATION STUDY		131,000
AN EVALUATION OF THE CONTRIBUTION OF CHINOOK SALMON REARED AT COLUMBIA RIVER HATCHERIES TO THE PACIFIC SALMON FISHERIES		334,000
COORDINATION OF SMOLT MONITORING		83,000
RADIO TRACKING STUDIES OF CHINOOK SALMON AND STEELHEAD TROUT TO DETERMINE THE EFFECTS OF "ZERO" FLOW DURING WATER STORAGE AT LITTLE GOOSE DAM ON LOWER SNAKE RIVER		309,000
FLOW AND SPILL REQUIREMENTS OF JUVENILE FALL AND SUMMER CHINOOK SALMON IN JOHN DAY RESERVOIR		98,000
COORDINATED ASSEMBLAGE AND ANALYSIS OF ANADROMOUS FISHERY INFORMATION AND DATA FOR IMPLEMENTATION OF SECTION 4(H) OF PL 96-501		149,323
MIGRATIONAL CHARACTERISTICS OF JUVENILE SALMONIDS IN THE COLUMBIA RIVER ESTUARY		208,000
COORDINATED BUDGET PROPOSAL FOR IMPLEMENTATION OF PL 96-501 (WILDLIFE AND RESIDENT FISH COMPONENT OF SECTION 4 (H)	U.S. FISH AND WILDLIFE SERVICE	27,000
STUDY OF WILD SPRING CHINOOK IN THE JOHN DAY AND DESCHUTES RIVERS	OREGON DEPARTMENT OF FISH AND WILDLIFE	218,000
CODED WIRE TAG SAMPLING SHORTFALL		195,035
CODED WIRE TAG SAMPLING SHORTFALL	WASHINGTON DEPARTMENT OF FISHERIES	34,501
CODED WIRE TAG SAMPLING SHORTFALL	WASHINGTON DEPARTMENT OF GAME	41,100
EFFECTS OF OPERATION OF KERR AND HUNGRY HORSE DAM ON REPRODUCTIVE SUCCESS OF KOKANEE IN THE FLATHEAD SYSTEM	MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS	251,000
DESIGN OF JUVENILE STEELHEAD IMPRINTING AND RELEASE FACILITIES AND ADULT COLLECTION FACILITIES	CONFEDERATED TRIBES OF THE UMATILLA INDIANS	18,000
TRIBAL INPUT TO ANADROMOUS FISHERY COORDINATION ACTIVITIES OF THE AD-HOC AGENCY EXECUTIVE COMMITTEE	COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION	57,000
ESTABLISHMENT OF BASELINE INFORMATION FOR THE WARM SPRINGS INDIAN RESERVATION	CONFEDERATED TRIBES OF THE WARM SPRINGS INDIANS	12,200
TOTALS: 17	9	2,262,159

Fish and Wildlife Program Project Expenditures

Project No.	Agency	Project Title	FY 78	FY 79	Total Allocated FY 80	FY 81	FY 82
78-1	NMFS	Imprinting of hatchery-reared salmon and steelhead trout for homing of transported fish.	400,000	306,000	398,000	96,000	(109,000)*
78-2	USFWS BIA	Streamflows and production " "	71,000 29,000	104,500	55,000		
78-2A	BIA	Shitike Creek fishway modification		60,000	(unspent project dissolved)		
79-1	USFWS NMFS	Genetic identification study		66,600	88,900	131,000	(144,433)
79-2	NMFS	An evaluation of the contribution of Chinook salmon reared at Columbia River hatcheries to the Pacific salmon fisheries		240,000	264,700	334,000	(385,000)
79-3	U of ID	Effects of power peaking on fall Chinook egg incubation and hatching		33,000			
79-4	ODF&W	Study of wild spring Chinook in the John Day and Deschutes Rivers John Day only		305,128	317,249	218,000	(300,000)
79-5	NMFS	Survey and evaluation of fish protective facilities at water withdrawals in the Columbia Basin		95,000	145,100		
79-6	USFWS	Backwater Studies above Bonneville		83,000	65,000		
80-1	CRFC	Coordination of smolt monitoring			75,000	83,000	(134,688)
80-2	NMFS	Radio tracking studies of Chinook salmon and steelhead trout to determine the effects of "zero" flow during water storage at Little Goose Dam on Lower Snake River			27,000	309,000	(12,380)

Project No.	Agency	Project Title	Total Allocated FY 78	FY 79	FY 80	FY 81	FY 82
81-1	NMFS	Flow and spill requirements for juvenile fall and summer Chinook salmon in John Day Reservoir				98,000	(150,406)
81S-1	NMFS	Coordinated assemblage & analysis of anadromous fishery information & data for implementation of section 4(h) of PL 96-501				149,323	
81S-2	NMFS	Migrational characteristics of juvenile salmonids in the Columbia River Estuary				208,000	(255,000)
81S-3	ODF&W WDG WDF	Coded wire tag sampling shortfall				195,035 41,100 34,501	(37,000) (113,871) 63,677 (61,323)
81S-4	USFWS	Coordinated budget proposal for implementation of PL 96-501 (Wildlife and Resident Fish Component of Sec. 4 (h))				27,000	
81S-5	MDFWP	Effects of operation of Kerr and Hungry Horse Dam on reproductive success of Kokanee in the Flathead System				251,000	
81S-6	**	Design of juvenile steelhead imprinting and release facilities and adult collection facilities				18,000	
81S-7	CRITFC	Tribal input to anadromous fishery coordination activities of the Ad-hoc Agency Executive Committee				57,000	
81S-8	***	Establishment of baseline information for the Warm Springs Indian Reservation				12,200	
		Totals for Fiscal Years	500,000	1,233,228	1,435,949	2,262,159	

* Parentheses denote requested amounts
** Confederated Tribes of the Umatilla Indians
*** Confederated Tribes of the Warm Springs Indian Reservation of Oregon

TABLE 3

COLUMBIA RIVER FISHERIES COUNCIL
RECOMMENDATIONS TO BPA
FOR FY 1982
FISH AND WILDLIFE PROGRAM

CONTINUATION OF ONGOING PROJECTS

Project No.	Agency	Project Title	Total Request for FY 1982
78-1	NMFS	Imprinting of Hatchery-Reared Salmon and Steelhead Trout for Homing of Transported Fish	109,000
79-1	NMFS	Genetic Identification of Columbia River Stocks	144,433
79-2	NMFS	An Evaluation of the Contribution of Chinook Salmon Reared at Columbia River Hatcheries to the Pacific Salmon Fisheries	385,000
* 79-4	ODFW	Study of Wild Spring Chinook in the John Day River System	300,000
80-1	CRFC/NMFS	Coordination of Smolt Monitoring	134,688
80-2	NMFS	Radio Tracking Studies of Chinook Salmon and Steelhead Trout to Determine the Effects of "Zero" Flow at Little Goose Dam on Lower Snake River	12,380
81-1	NMFS	Flow and Spill Requirements for Juvenile Fall and Summer Chinook Salmon in John Day Reservoir	150,406
81-S2	NMFS	Migrational Characteristics of Juvenile Salmonids in the Columbia River Estuary	255,000
81-S3	WDF	Coded Wire Tag Sampling	125,000

NEW PROJECTS

82-1 (102)	ODFW	Fall Chinook Rearing at Stayton/ Aumsville Ponds	200,700
82-2 (81)	NMFS	Flow Net Relationships in John Day Forebay	131,300
82-3 (97)	WDF	Wild Spring Chinook Enhancement - Upper Columbia	78,000

NEW PROJECTS (continued)

	Project No.	Agency	Project Title	Total Request for FY 1982
	82-4 (100)	OSU	Rapid Diagnosis of IHN Virus	12,600
	82-5 (62 & 84)	NMFS/OSU	Effects of Oceanic Conditions on Juvenile Salmon Distribution, Abundance, and Growth	777,300
	82-6 (29)	USFWS/ Idaho Coop	Effects of Stress on Transported Chinook Smolts	94,100
	82-7 (96)	WDF	Catalog of Washington Streams	85,400
	82-8 (6)	USFWS	Bioenergetics of Juvenile Salmon Outmigration	55,600
	82-9 (16)	USFWS	Control of IHN Virus in Sockeye and Chinook Salmon	135,000
*	82-10 (39)	ODFW	Population Studies of Predator and Prey Fish - John Day Reservoir	217,400
	82-11 (9)	USFWS	Predator Food Habit Studies - John Day Reservoir	143,700
	82-12 (69)	ODFW	Fall Chinook and Coho Broodstock Development	113,400
*	82-13 (65)	ODFW	Habitat Improvement - N.E. Oregon	99,600
*	82-14 (66)	ODFW/USFS/ BLM	Habitat Improvement - John Day River	217,900
	82-15 (19)	USFWS	Develop Juvenile Transport Media	79,300
	82-16 (22)	OSU	Enhanced Smolt Quality in Transportation	75,000
	82-17 (75)	NMFS	Snake River Fall Chinook Brood Development - Manchester	123,600
	82-18 (76)	NMFS	Test of Genetic Identification in a River Fishery	29,500
	82-19 (53)	NMFS	Barging/Imprinting Experiments	108,300

* To be submitted to BPA by November 10, 1981.

TABLE 4

ENTITIES CONDUCTING RESEARCH ON ANADROMOUS FISH, RELATED SPAWNING GROUNDS, AND HABITAT ON THE COLUMBIA RIVER AND ITS TRIBUTARIES

1. National Marine Fisheries Service
2. U.S. Fish and Wildlife Service
3. U.S. Forest Service *
4. Bureau of Land Management *
5. Bureau of Reclamation *
6. Confederated Tribes of the Warm Springs Reservation
7. Confederated Tribes of the Yakima Indian Reservation
8. Confederated Tribes of the Umatilla Reservation
9. Nez Perce Tribe
10. Washington Department of Fisheries
11. Washington Department of Game
12. Oregon Department of Fish and Wildlife
13. Idaho Department of Fish and Game
14. U.S. Army Corps of Engineers *
15. Grant County Public Utility District *
16. Douglas County Public Utility District *
17. Chelan County Public Utility District *

* Not presently a member of the Columbia River Fisheries Council

U.S. ENVIRONMENTAL PROTECTION AGENCY - REGION X

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: M/S 443

13 NOV 1981

Honorable Daniel J. Evans
Chairman, Northwest Power Planning Council
700 S.W. Taylor, Suite 200
Portland, Oregon 97205

Dear Chairman Evans:

The Environmental Protection Agency is pleased to submit for your consideration the attached recommendations for developing the fish and wildlfe plan required by Section 4(h) of Public Law 96-501.

As you probably know the principal EPA program with relevance to fisheries protection and enhancement is our water quality protection program under the Federal Clean Water Act, as amended. Specifically, the Clean Water Act, in Section 101(a)(2) states that one of its national goals is the attainment of "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water"...by July 1, 1983. We believe that substantial progress has been and is being made toward achieving the goal within Region 10.

Virtually all of the major industrial dischargers along the Columbia River and its tributaries meet the water pollution control requirements established for them pursuant to the Clean Water Act. Many of the publicly owned wastewater treatment works either have been upgraded or will be upgraded within the next few years to meet the corresponding requirements applicable to them. State and local governments have developed programs for controlling pollution from "non-point" sources such as agricultural operations and silviculture practices and are implementing these programs in accordance with agreements between EPA and the State environmental protection agencies that govern our joint implementation of the Clean Water Act, as well as other Federal environmental legislation.

EPA expects the continued implementation of these programs under the Clean Water Act to contribute to further improvements in water quality and aquatic habitat. Additionally, other programs of the Agency recognize the importance of protecting fisheries habitat. For example one of the principal issues which we address in our review of Corps of Engineers

permits, issued under Section 404 of the Clean Water Act, is the preservation and protection of aquatic habitat. Similarly protection of fisneries nabitat is a major concern in our review of all major Federal actions tht we carry out under Section 309 of the Clean Air Act, as amended.

Thus it is fair to say that EPA supports the intent and goals of the Power Planning Council's enabling legislation with respect to fisheries protection, mitigation, and enhancement. It is within that context that the attached suggestions are offered for the Council's consideration in the development of its fisheries plan and program. Please feel free to contact me for further clarification of our recommendations. I can be reached at (206) 442-1266.

Sincerely,

Roger K. Mochnick for

Elizabeth Corbyn, Chief
Environmental Evaluation Branch

Attachment

cc: Mr. Tom Edwards, U.S. Geolgoical Survey, Boise
Mr. Dick Cunningham, Washington Department of Ecology, Olympia
Ms. Gwen Burr, Idaho Department of Health and Welfare, Boise
Mr. Andy Schaedel, Oregon Department of Environmental Quality, Salem

EPA Recommendations

1. The Federal government has constructed a series of fish hatcheries along the Columbia River and its tributaries to mitigate the adverse impacts which Federally constructed hydroelectric dams have had on the fisheries of the Columbia River System. Up to now the Federal budget has included the funds necessary to pay the operating costs of these hatcheries. It is our understanding that, beginning in Fiscal Year 1983, these operating costs will not be provided for in the Federal budget. It is also highly unlikely, given the budget problems that all of the states within the region are experiencing, that the states will be able to assume this financial burden. Therefore we believe that it is not only appropriate, but necessary, for the Council to consider providing for the continued operation of these hatcheries within its plan and program. Specifically, it would be fully consistent with the Pacific Northwest Electric Power Planning and Conservation Act for the program to provide for the operation of these hatcheries by or under the direction of the Bonneville Power Administraton with the operating costs being paid for out of BPA's wholesale power rates. Although this would probably entail an increase in BPA's power rates, it would be fully consistent with the Power Act's requirement that power consumers pay the costs of mitigating the impacts of power generation on fisheries.

2. Recent budget cuts at the Federal and state levels have reduced water quality monitoring to a "bare bones" level. The U.S. Geological Survey, for instance, has had to reduce their frequency of sampling from monthly to bi-monthly tests. Seven of the sites previously monitored by the U.S. Geological Survey (with EPA funding) in Idaho have been turned over to the State Department of Health and Welfare's Division of Environment. They in turn express doubts that they will have sufficient resources to continue operating these stations in the future. The Oregon Department of Environmental Quality's monitoring staff has been cut nearly in half. The EPA's monitoring efforts have also been severely restricted. These cutbacks come at a time when development of our region's waterways is at a peak. There are currently over 250 applications for hydroelectric projects in the State of Washington alone. While the water quality impacts of hydroelectric developments have been well documented in isolated circumstances, for the most part dams are unregulated and their water quality impacts undocumented. Furthermore, most water quality monitoring sites are located in the lower river reaches whereas hydroelectric development tends to take place in the upper reaches. EPA therefore recommends that the Regional Power Council fund an assessment of the adequacy of current water quality monitoring efforts within the Columbia River watershed in Washington, Oregon and Idaho in terms of present capability to (1) identify water quality problems that may be caused by hydroelectric dams and other energy facilities and (2) to establish an adequate baseline of water quality data for rivers and streams likely to be developed for hydroelectric generation in the future. This assessment should be a cooperative effort involving the U.S. Environmental Protection Agency, the U.S. Geological Survey, the

Washington Department of Ecology, the Oregon Department of Environmental Quality and the Idaho Department of Health and Welfare. Furthermore, on the basis of this assessment, the Regional Power Council should insure that the Fish and Wildlife Program required by Section 4(h) of Public Law 96-501 includes provisions for adequate water quality monitoring of existing and proposed energy facilities within the Columbia River watershed.

3. EPA concerns regarding fish and wildlife center mainly on the maintenance of adequate quantity and quality of water to meet the fishable and swimmable water goals of the Clean Water Act. Quantity of water is vital to enhancement of fishery and recreation uses. Adequate flows are necessary to maintain the water quality standards. Special concerns regarding energy development projects are dissolved oxygen (DO) and temperature. Freshwater organisms are especially sensitive to decreased DO levels. However, large impoundments can cause both reduction in DO and changes in water temperature downstream. These effects can be mitigated in most cases to acceptable levels through proper operation and construction of dams. Downstream temperatures can be regulated, for instance, by the use of multi-level intakes. DO can also be maintained at proper levels by providing adequate flows and, in some cases, aerators. Other water quality problems, such as dissolved gas supersaturation, are also amenable to mitigative measures. What is lacking in many cases is the incentive or requirement to provide such measures at existing and proposed hydroelectric projects. The Regional Power Council should therefore include as a provision of the Fish and Wildlife Program a mechanism to insure that water quality mitigation measures will be required, as necessary, of all new hydroelectric developments and that existing hydroelectric projects will be retrofitted, as necessary and practical, with such mitigation devices.